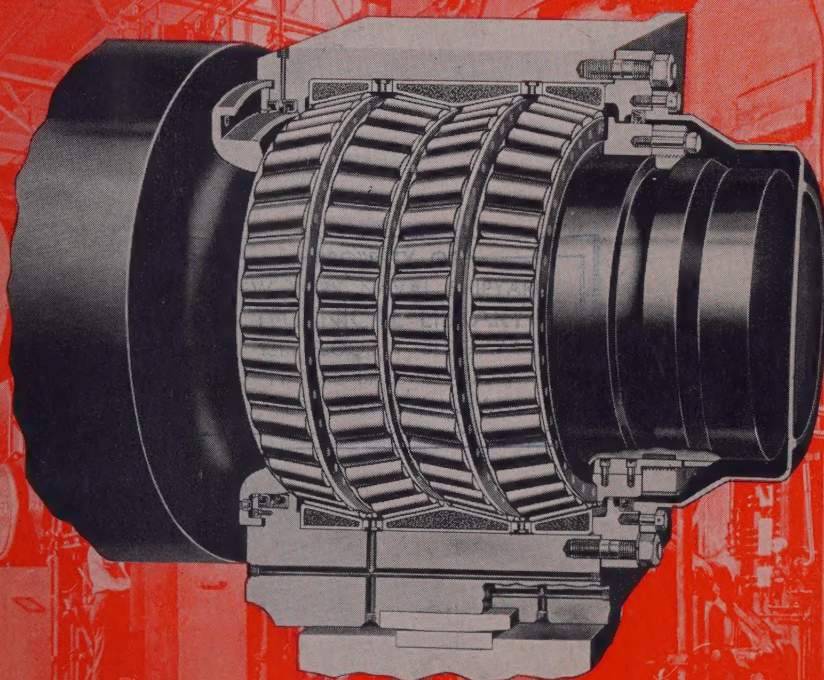


STEEL

The Magazine of Metalworking and Metalproducing

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HOW TO **STOP** AND **RE-START** ROLLING MILLS WITHOUT LOSING STEEL



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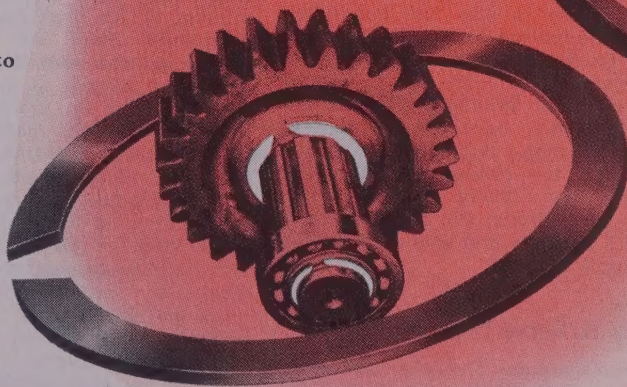
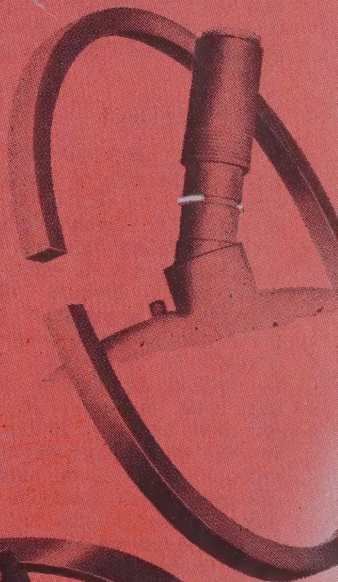
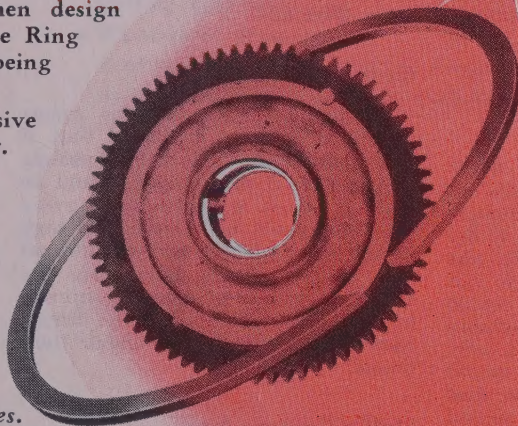
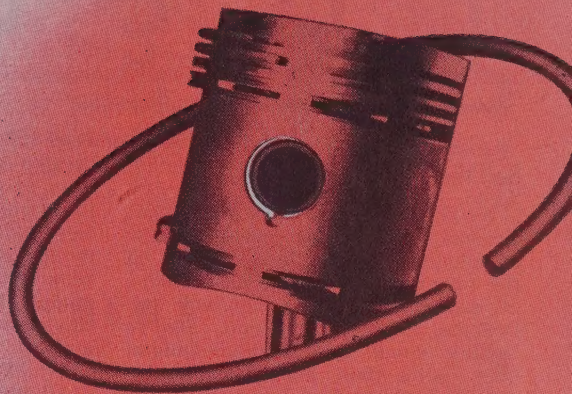
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Behind the Scenes...

Sell the Editors

We note from last week's book that General Electric has joined the list of advertisers who have drawn on the talent of our editors as a source of advertising copy. Quoting Jay DeEulis, engineering editor, they're talking about how Fedders-Quigan Corp. saves time, money and materials in making fin-tubes. Of course we think their copy is greatly improved because it leads off with the extremely important phrase, "Behind the scenes". More than that, though, it is typical of what we keep talking about—on two counts. First, it underscores the type of helpful information which our staff is constantly supplying for you readers, and it also shows how advertisers can take advantage of this important quality of our editorial job in presenting their sales messages.

Red Faces Dept.

How it happened we are never going to be able to tell you, but at any rate, we must here publicly apologize for our short answer to the tennis problem last week. It was correct as far as it went, but it just didn't go far enough. There would have to be a total of 77 matches played, but since we asked for a daily schedule in the puzzle, they should be divided as follows: 39 the first day, with no byes; 19 the second day with one bye; 10 the third day; five the fourth day; two the fifth day with one bye; one the sixth day with one bye; and the finals on the seventh day. There is also the possibility of an elimination round the first day with fourteen matches, followed by the first regular round on the second day with 32 matches, 16 matches the third day, eight the fourth day, four the fifth day, two the sixth day with the championship on the seventh day. There are, of course, other possibilities; the real answer is still 77 matches and shame on us for lousing it up.

Want To Serve Youth?

From Germany the other day came a letter from Gerhard Schenderlein, an earnest youth whose ambition in life is to be an engineer, specializing in engine building. He has graduated from high school, is now 17 years old, and is working in a tool factory in Offenbach in the American zone. Recently at the "American-haus" in his home town, he came across some copies of STEEL, which he says is

"really wonderful". We, of course, have to agree. He expects to work for three years and then go to college for his engineering degree, but in the meantime, he would like to have some copies of our magazine to study. In fact, he is so moved by this idea that he has even written a poem:

"The workman forged it
From ore to a wheel
If you needs a tool
It must be only of STEEL."

This was accompanied by a drawing of a steel plant, nestling in pine-covered mountains beside a large river. We think such efforts probably should be well rewarded, so if any of you readers want to get rid of some back copies, the address is Wilhelmstrasse 16, Offenbach am Main, Germany.

Gosh—All Fish Hooks

We just found out, via the American Iron & Steel Institute, that if you had all the fish hook business in the United States, you would be making about a half-million every day, and you'd be chewing up high carbon steel wire at the phenomenal rate of 300 pounds daily. We are sure that will be of seasonal interest at this time, at least to the fishermen who are worried about their hooks.

Half a Century Ago

Notes from our issue of July 6, 1899—A. B. Farquhar of York, Pa., sailed last week for Havana in the interest of his implement trade . . . Bethlehem Steel Co. in the past twelve months earned \$695,500. . . The labor trouble at the Homestead steel works of the Carnegie Steel Co. has been greatly magnified by the daily press. . . Within a short time the plant of Brown & Sharpe Mfg. Co., Providence, will be enlarged by the addition of a foundry and a machine shop. . . Balls are now being successfully applied as bearings in windmills, coffee grinders, water pipes and gasometers. . . The E. P. Allis Co., Milwaukee, is making a number of additions. The first is a foundry to cost \$12,000. . . At Lynchburg, Va., fire destroyed the foundry of the Glamorgan Pipe & Foundry works, together with valuable patterns—total loss, \$10,000.

Shradu

(Editorial Index—page 27)

STEEL

Vol. 125—No. 1

July 4, 1949

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Straightening, Polishing

How To Procure Tools

New Developments in
Corrosion-Resistant Coatings

Production of Hot and Cold
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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 125, NO. 1

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JULY 4, 1949

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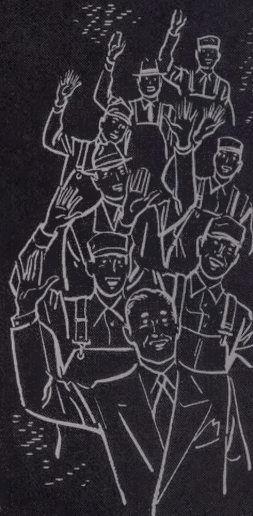
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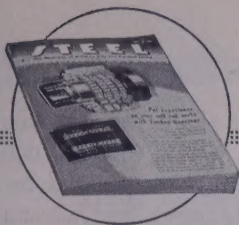
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AS THE EDITOR VIEWS THE NEWS

July 4, 1949

About Face for Truman!

For a number of months, President Truman has been brushing off the decline in business by saying it amounts to little more than a healthy readjustment to more stable levels. Additional adverse business-weather statistics, however, plus powerful prodding by the labor unions appear to have convinced the President it is time to do an "about face" in viewing the economic outlook.

Last October and November, industrial production reached an all-time peak of 195 per cent of the 1935-39 average. In May, it dropped for the sixth month to 174, lowest since July, 1946. Many expect the index to settle to the low 160s late this year—or about the 1941 average—before it swings upward. Lay-offs and shorter work weeks in many plants in the face of high living costs have resulted in increasing employee dissatisfaction, pressure on union leadership for relief and, in turn, pressure on the government for direct action.

A few days ago, Chairman Edwin Nourse of the Council of Economic Advisers gave the President a midyear report appraising the state of the economy. Next Monday, the President is scheduled to reveal the contents of the report and make recommendations to Congress. It is a foregone conclusion measures will be suggested which will add billions to the nation's spending power, including reduction in excise and lower-bracket income taxes, an expanded housing and public works program, extension of the veterans readjustment benefits program and additional social security benefits.

As part of the new era of deficit financing for which the government is obviously committed, the President conceivably may support a half dozen bills being readied for Congress which, among other things, would set up a TVA for the Pacific Northwest, construct the St. Lawrence seaway, provide \$5 billion for an emergency public works program, expand the social welfare program, subsidize shipbuilding and underwrite the Brannan plan permitting purchase of consumer goods at less than production cost.

In its "about face" planning, the administration very well could draw on the advice and assistance of business leaders who, unlike the government, find it necessary to give some consideration to balance sheets and profit and loss statements. A more realistic depreciation structure on capital equipment alone would permit industry to replace obsolete machines and set off a chain reaction of increased employment.

* * *

ROLLING ALONG: Considering the contraction in most branches of the economy over past months, the performance of the automotive industry is especially outstanding. The way it has continued to roll along at peak production in face of deflationary forces which have forced substantial curtailments in most directions, attests to the strong hold of the automobile on the American public.

This industry, along with steel, has provided major support to the sagging economy since the first of the year. As a matter of fact, autos

have been the main prop since much of steel's strength has stemmed from auto steel demand. Steelmaking operations, sliding since March, still are headed downward. On the other hand, auto production set a 20-year benchmark in June with an output above 600,000 units, largest monthly total since April, 1929. In the first six months an estimated 3,140,000 cars and trucks were turned out, considerably above predictions at the turn of the year.

The remarkable thing about this showing is the fact it was achieved despite strikes, slow-

(OVER)

AS THE EDITOR VIEWS THE NEWS

downs and other interruptions. Nearly all builders experienced production losses, either through work stoppages in their own plants, or in plants of suppliers.

Expectations are auto schedules will slacken in August and ease further in the fall. However, no one expects the bottom to fall out of car demand. The way is clear, for raw materials now are in comfortable supply, and declining costs may provide sufficient margin to permit price reductions should demand lag to the point where a sales stimulus is needed.

—p. 49

* * *

ACTION ASSURED: Passage of the O'Mahoney delivered price bill, it appears, will not be greatly delayed by the launching of a new series of hearings by Representative Wright Patman of Texas as had at first been feared. The House Rules Committee has approved prompt consideration of the measure and its early passage now seems assured.

Just why Representative Patman should throw a monkeywrench into the works at this point is difficult to fathom. His reputation as a defender of small business would seem in question in attacking the O'Mahoney bill on the ground it would cut the heart out of the Robinson-Patman Act by giving large buyers advantages over small ones. Testimony at hearings conducted by a Senate committee last year overwhelmingly refutes such a charge.

Senator O'Mahoney, sponsor of the bill which passed in the Senate, certainly is not an advocate of big business. It would seem Patman should be willing to go along with O'Mahoney in order to avoid further delay in enacting into law a pricing measure that would help take all business "off the hook."

—p. 38

* * *

TIMES CHANGE: Just a year ago the raw material shortage was at its most acute stage. Steel and pig iron supplies were insufficient to care for all the needs of consumers. Voluntary allocations were taking around 9 to 10 per cent of monthly finished steel output for so-called essential consumption.

How different the situation today! Steel now is available in many products for practically immediate delivery. Pig iron is in excess supply with stocks piling up in producers' yards and blast furnaces going out of production. Scrap is freely available and prices are off sharply. Voluntary allocations will be suspended at the end of September.

As illustrative as anything of the change that

has taken place since a year ago is the situation in freight cars. Last year at this time 250,000 tons of steel monthly were being allocated for new cars urgently needed to carry the railroad freight load. Today, not a pound of steel is on allocation for July shipment for this purpose.

—p. 38

* * *

PRIVATE ENTERPRISE: Launching of Inland Steel Co.'s new lake ore freighter, the Wilfred Sykes, at the Lorain, O., shipyard last week, prompts the observation that construction of this vessel provides a stinging rebuke to those detractors who challenge the willingness of private enterprise to take a risk when the business outlook becomes a little cloudy.

Unofficial cost of this new lake ore carrier is placed at \$5 million, but it probably will exceed this sum by a comfortable margin by the time it is ready for service next April. Such sizable expenditure is typical of the risks taken by American business in good times and bad, but in a time of business recession it is particularly significant of the motivating power of the profit and loss system which has worked toward the building of a better and greater America through the years.

The Wilfred Sykes is the first ore carrier to be launched on the Great Lakes since early in World War II. She is not only the fastest bulk carrier on the lakes, but is the largest, being the first to exceed 20,000 tons carrying capacity.

—p. 39

* * *

EFFECTIVE LUBRICATION: Machine tools today are capable of turning out finished products at speeds and accuracies that are astounding. Mechanically, such performance is possible because machine tool manufacturers, through years of experience, have been able to perfect smooth functioning components in each machine. A very important factor contributing to the performance of these machine elements is effective lubrication.

Effective lubrication means more than use of the correct lubricant at the right place in sufficient quantity to "grease" moving surfaces. It includes also the use of products that "stay put" in the machine without breaking down and in minimum quantities that prevent unnecessary wastage.

—p. 70

Irwin H. Such

EDITOR

STEEL

NEW VIEWPOINT—President Truman who doggedly maintained the country was still threatened with inflation after business leaders pointed out a recession had set in now agrees something must be done about rising unemployment (p. 35). As result of pressure from organized labor for government action to halt the business downtrend the President has said he will give Congress his views in July in a message accompanying the midyear report of his Council of Economic Advisers. Because of the President's consistent heedfulness of the opinions of organized labor his July recommendations are expected to be far-reaching.

BRIGHT SPOT—Although the national rate of steel ingot production continued its decline, subsiding to 80 per cent of capacity last week (p. 125), the No. 2 seamless pipe mill at the McKeesport, Pa., plant of National Tube Co. will be stepped up on July 10 from a six-day to a seven-day week basis, with three turns each day. This will return the unit to the schedule at which it operated during the war. The company, a U. S. Steel Corp. subsidiary, has scheduled the accelerated rate because of the "the greater availability of carbon steel and continued demand for seamless pipe."

STEEL PRICES HOLD—Until steel producers know what effect current labor contract negotiations with the steelworkers and coal miners will have on labor costs there is not likely to be any reductions from the standard base prices and extras on steel. Thus far, downward adjustments have been confined to premium prices. Of 36 reductions, chiefly premium prices, 18 concerned base prices and 18 affected extras (p. 37).

PRICE MEASURE ADVANCES—The House Rules Committee last week cleared the O'Mahoney delivered price bill for consideration by the House. The bill's chances for early passage now seem assured. This despite a delaying action in the form of a new series of hearings by the House Small Business Committee launched by its chairman, Rep. Wright Patman of Texas. The representative's arguments for delay didn't get anywhere with the Rules Committee (p. 38).

NEGOTIATIONS CONTINUE—United Steelworkers of America—CIO has agreed to resume labor contract bargaining conferences with U. S. Steel Corp. July 6 in Pittsburgh (p. 37). Last week the union sent the corporation written statements and data in support of demands made verbally in initial bargaining sessions. Contract negotiations between the United Mine Workers and northern bituminous coal mine operators were recessed last Thursday until July 12. Just before the recess, the UMW chieftain, John L. Lewis, ordered a three-day work week for all soft coal mines east of the Mississippi, beginning July 5.

UNION'S EMPTY VICTORY—A ten-month strike at the Fairmont City, Ill., plant of American Zinc, Lead & Smelting Co. discouraged the company to such an extent it pulled the fires from its roaster kiln and furnaces (p. 37) and permanently eliminated 450 jobs. In hope of a settlement, the company had maintained the fires since last August, for once the furnaces were cooled they could not be used again without expenditure of \$1 million and six months' restoration work.

HERE AND THERE IN INDUSTRY—Initial phase of President Truman's Point Four program to aid industrially underdeveloped countries will call for U. S. engineering and research personnel and services on an unprecedented scale (p. 45) . . . Tentative approval reportedly has been granted for earmarking of \$49 million of ECA funds for hot and cold-rolling facilities for French steel mills (p. 40) . . . Electroplaters show little apprehension over long-term business prospects (p. 40) . . . June automobile production topped the 600,000-mark for the first time in 20 years (p. 49) . . . Kaiser-Frazer Corp. is toying with the idea of setting up 1000 small assembly plants throughout the country (p. 50). K-F's theory is that it would foster good labor relations.



Time to re-live a memory?

Somewhere in every man's memory, half-hid by the veil of time, there's a scene like this. If it wasn't the thrill of catching your first fish, it might have been the day you first swam alone, or the day you first pulled the trigger of a shot gun, with somebody else shouldering the stock to absorb the kick. Exactly what it was doesn't matter. It was an unforgettable moment in your life.

Summertime makes those memories live again. A man wants to go back to those care-free, sunny days when a quick tug on the

line, the old swimming hole, or a brand new fielder's glove was the only thing that mattered. So, you take a vacation. And you realize again that those simple pleasures, with the workaday world behind you, are almost as good as ever.

When you take your vacation this year remember that Ryerson stocks are again large and complete—and that service is immediate. Just tell the boys who pinch-hit for you while you're away to call our nearest plant for every steel requirement.

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Truman Pressed To Do Something

Under pressure from labor unions President changing his views on business recession. Expected to make far-reaching recommendations to Congress this month

FROM now on there will be no further explanations from White House and other administration spokesmen that the current business recession is a "healthy" one. About three weeks ago labor union officials started to put the heat on the President, Congress and government brass hats.

Since then labor delegations have been making the Washington rounds, and there have been numerous meetings of labor and pro-labor organizations attended by government representatives. The upshot is that President Truman on June 23 agreed with a delegation of congressmen that something must be done about rising unemployment. He said he would give Congress his views in July in a message accompanying the midyear report of his Council of Economic Advisers.

Heads Labor—Because of the President's consistent heedfulness of the opinions of organized labor, his July recommendations probably will be far-reaching. Labor spokesmen say flatly they look to the government to arrest the downward trend of employment; "to do something big now" to halt a dangerous slide downwards in the economy.

As an example of the stories that are being told in Washington, a delegation from the United Electrical Workers (CIO) has informed the President and Congress 50 per cent of its members have been laid off or are working on reduced schedules. They want government action which will enable all their members to work full time.

Master Pattern—Every labor union, of course, looks at the picture from its own individual standpoint, but in general there is a disposition to adhere to the master pattern set up in a report by the Public Affairs Institute of which Dr. Dewey Anderson, who has done important staff work for committees of Congress and has a wide following among "liberal" legislators, is executive director. Title of the report is "Unemployment: It's Here—Let's Stop it Now." In this report, Dr. Anderson, who first gained fame by a star performance in directing the studies of

Senator O'Mahoney's old Temporary National Economic Committee, says definitely that it is now too late in the downswing in the economic cycle to effect a balanced budget by cutting government expenditures. He further says if the downswing is to be halted "something must be done now to give businessmen proof of the firmness and high level of demand."

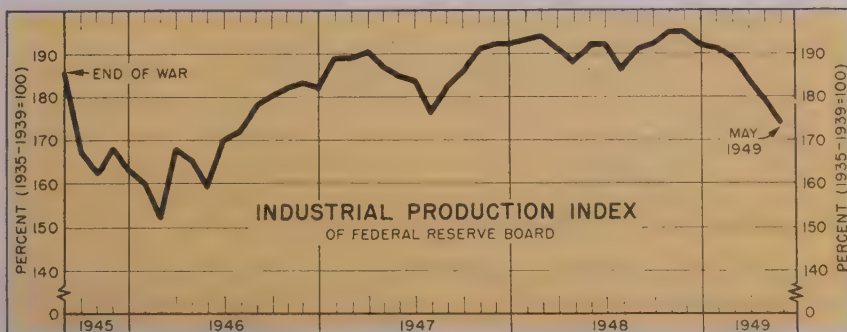
The immediate need, he says, is for the government to put more spending power into the hands of prospective purchasers. It would do this by raising exemptions in the lowest tax paying brackets and reducing rates in the middle brackets. The position of the lowest income groups which do not pay taxes would be improved by extending the expiring Veterans Readjustment Benefits program and assuring other benefits to veterans; by increasing unemployment benefits and old-age benefits; by removing eligibility restrictions on public assistance; and by increasing federal public assistance, subject to state matching, to \$2 billion for fiscal 1950. Other measures advocated by Dr. Anderson include initiation of emergency public works and service projects and a broadening of federal-aid-to-education which would keep more youths in school for longer periods.

Liberal Credit—Of interest to business is Dr. Anderson's conclusion

that "we need liberal credit policies and profits as an incentive to investment and output" and "we need . . . price policies that will make for increasing levels of consumption expenditures both absolutely and as a per cent of total demand." Without proper stabilization measures as to taxes, wages and prices, he says, "increasing levels of government and private levels tend to become self-nullifying"

Now that the President has agreed something must be done about rising unemployment, anti-depression planning in Washington has been stepped up. In Congress, a group headed by Senator James E. Murray (Dem., Mont.) is attempting to perfect the so-called "Economic Expansion" bill under which a National Economic Cooperation Board would work with the President's Council of Economic Advisers to determine what steps are necessary to keep the economy on a stable basis; this bill would authorize vast expansion programs to be executed or financed by the government. The Chavez bill to authorize a shelf of plans for public works and acquire suitable sites for them immediately is in conference. Several bills, like the O'Brien proposal to provide \$5 billion cash for public works, are being studied. The establishment of a Columbia Valley Authority is being expedited; the St. Lawrence seaway project has been revived; the social welfare bills are in final stages of being readied; an omnibus bill to subsidize all shipbuilding can be ready to be reported soon; the Senate is reviving its Small Business Committee, etc.

At Fever Stage—On the administration side the planning is at fever



Declines in steel production and nonferrous metals industries were reported by the Federal Reserve Board as major influences in lowering its industrial production index in May to 174 per cent of the 1935-1939 average of 100. May was the sixth consecutive month of decline. The chart shows the pattern of the board's index for the entire postwar period

stage, with many economists anxious to evolve the big idea that will "save the country against a repetition of the great depression of the '30s." What will go into the July economic report is not yet known; it is unlikely that some of the more "daring" concepts now under discussion will be featured in that report. But on one major point there seems to be majority agreement; that is, if the depression grows continuously worse the government will be committed to a big program of deficit financing.

Whether the Brannan-plan adaptation by which the public would be able to buy manufactured goods at lower prices, with the government absorbing the difference between market prices and cost-plus-a-profit prices (see STEEL of June 6, p. 69), will be recommended to Congress in July depends a lot on how the farmers react to the Brannan plan itself. It has not yet aroused enthusiasm in farm or legislative circles, but support for it is reported gaining.

Truman Gets Economic Report

PRESIDENT Truman last week received the draft of a midyear report on the economy from his three-man Council of Economic Advisers.

The summary will be made public when the President makes recommendations to Congress this month.

Average Earnings Up Slightly

RESPONDING to a minor extension of the workweek, average weekly earnings for the 11.8 million production workers in the nation's factories moved upward slightly from \$52.70 in April to \$53.08 in May, according to preliminary estimates of the Bureau of Labor Statistics.

Struthers Rebuilds Blast Furnace

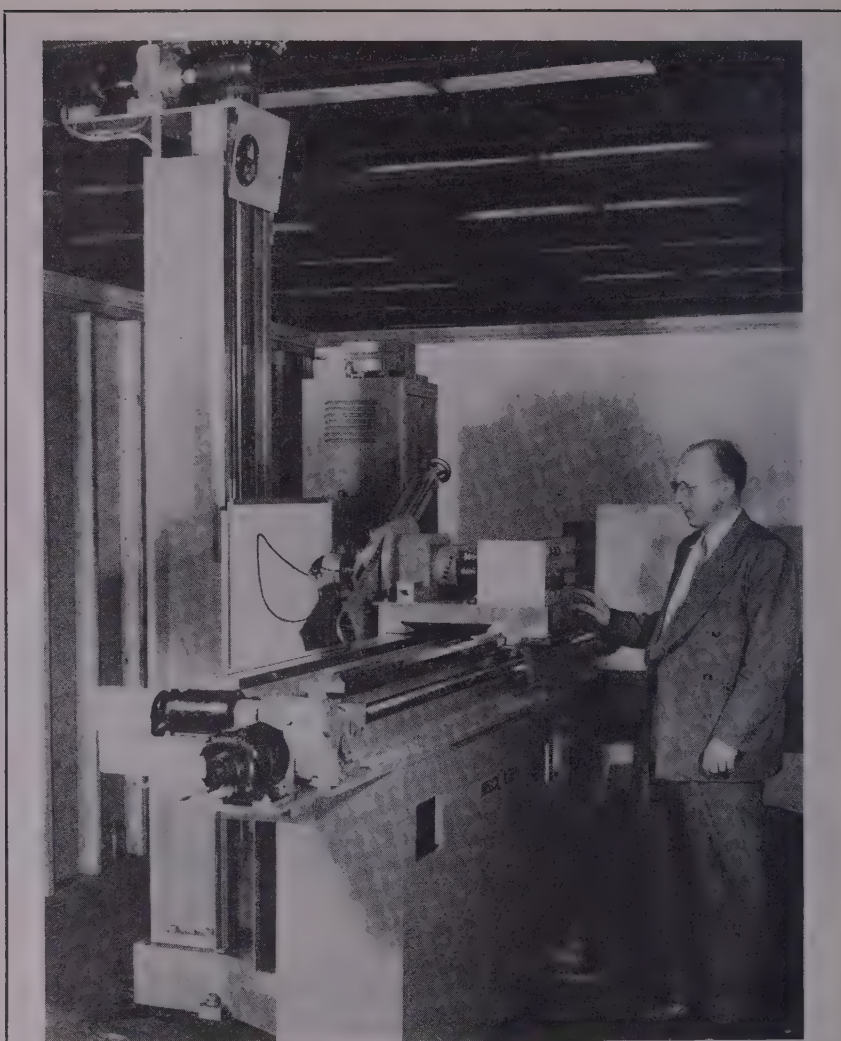
STRUTHERS Iron & Steel Co. is spending nearly \$500,000 to reline and rebuild its Struthers, O., blast furnace.

The company will not start the furnace until demand for pig iron increases. It previously had planned to start up about July 1 to fill a five-year pig iron contract for General Motors Corp.

The furnace formerly was leased by Kaiser-Frazer Parts Corp.

Army Awards More Contracts

DEPARTMENT of the Army has awarded the following contracts to private business concerns in the metalworking field:



"SEEING-EYE" FOR MACHINE: A new electronic instrument announced by General Electric Co. has an electric eye which follows the lines of a drawing and guides a machine tool to cut out metal parts in accordance with the drawing. Pictured are the scanning mechanism, the scanning head control panel being adjusted, and the horizontal and vertical guide ways and their associated drives. In the rear is the cabinet containing the electronic circuit

Espey Mfg. Co., New York, radio sets, \$989,426, and meter test equipment \$167,287; P. R. Mallory & Co., North Tarrytown, N. Y., batteries \$265,200; Sigma Instruments Inc., Boston, relays, \$175,325; Assembling & Packing Co., Specialty Engineering Division, Brooklyn, N. Y., radio sets, \$432,925; Plastics Wire & Cable Corp., Jewett City, Conn., wire, \$821,380; Bright Star Battery Co., Clifton, N. J., batteries, \$228,000; Henry Disston & Sons, Philadelphia, light armor plate, \$190,711; Century Tool Co., Washington, tool equipment, \$252,450; Hallcrafters Co., Chicago, radio receivers, \$143,274, and radio transmitters, \$175,694; Shallcross Mfg. Co., Collingdale, Pa., test equipment, \$101,172; Highway Trailer Co., Edgerton, Wis., trucks, \$409,432; General Cable Corp., Philadelphia, cable, \$256,620; Manufacturers Battery Co., Madison, Wis., batteries, \$151,725; Great American Industries, Meriden, Conn., telephones, \$492,529; Kurman Electric Co., Long Island City, N. Y., vibrators, \$145,204; Press Wireless Mfg. Co., Hicksville, N. Y., amplifiers, \$631,375; Price Battery Corp., Hamburg, Pa., \$107,400; Munston Mfg. & Service Inc., New York, test equipment and frequency meters, \$198,629; Telectro Industries Corp., Long Island City, N. Y., intercommunication stations, \$175,749; Continental

Electronics Ltd., Brooklyn, N. Y., telephone extension kits, \$359,102; General Electronics Inc., Paterson, N. J., electronic tubes and accessories, \$226,600; Specialty Assembling & Packing Co., Brooklyn, N. Y., tool sets, \$119,035; J. H. Bunnell & Co., Brooklyn, N. Y., radio transmitters and accessories, \$340,356; Continental Motors Corp., Detroit, engines, \$217,850; Chrysler Corp., Detroit, trucks and spare parts, \$14,243,501; Willys-Overland Motors Inc., Toledo, O., trucks and spare parts, \$12,464,013; GMC Truck & Coach Division, Pontiac, Mich., 5-ton carriers, \$1,325,533; Western Cartridge Co., East Alton, Ill., targets, \$240,348; Wallace Tube Co., Chicago, wedges and tools, \$201,015; American Car & Foundry Co., New York, domes, tools, and vent stacks, \$1,196,344; G. H. Anderson Co. Inc., Detroit, air compressors, \$126,550; American Brake Shoe Co., Rochester, N.Y., tools and equipment, \$249,895; International Harvester Co., Washington, trucks and spare parts, \$364,278; Reo Motors Inc., Lansing, Mich., trucks and spare parts, \$31,768,013; Maremont Automotive Products, Chicago, spare parts, \$186,750; Gar Wood Industries, Wayne, Mich., bulldozers and spare parts, \$277,012; Harnischfeger Corp., Milwaukee, Wis., crane shovels and parts, \$499,600.

Steel Prices Holding

Changes in base quotations and extras limited since first of year. Buyers expecting cuts

WITH DEMAND for steel on the downgrade, will steel base prices and extras be cut soon?

Many metalworking company purchasing agents and executives think a decline sufficiently likely to warrant them to carry on their current inventory reduction.

Thus far, downward price adjustments have been confined to the partial removal or abolition of premium prices. However, reductions below the current standard base prices and extras are highly unlikely until the steel industry knows what effect current labor contract negotiations with the steelworkers and coal miners' unions have on labor costs.

Studying Extras — For instance United States Steel Corp. announced at the end of April it was studying its extras with a view toward adjusting them into line with current production costs but so far the revisions have not been revealed, and the corporation did not say the results would be an overall reduction. In fact it said the revisions would result in higher charges for certain gages, widths, lengths and quantities, and in lower charges for others.

Further dampener on the hopes for steel price cuts was a recent statement by Frank Purnell, president, Youngstown Sheet & Tube Co. He said that until rail freight rates, steel labor rates, and raw materials prices decline sharply it will be impossible to make steel cheaper. In fact, declining operations, he declared, will make steel costs still higher.

Point to Extras — Among those speculating as to how reductions might be made in the structure of standard prices some firmly believe any revisions would be confined to

extras. They point out that steel extra cards today exert a much more important role in actual steel costs than they did before the war, and that consequently any changes are more likely to be centered in extras than in base prices. On the other hand, some observers emphasize that it is a highly complicated job to change extras and that adjustments likely would be made on base prices.

However, intensity of competition will very likely determine whether reductions will take place in base prices or extras, or both. Of 36 downward adjustments reported in STEEL since the first of the year, 18 concerned base prices and 18 affected extras. Reductions in January were centered in extras. As the year progressed there were an increasing number of cuts in base prices. May was the high point for reductions in extras, and in June they were negligible in number. However, half of the reductions in base prices in the first six months occurred in June.

Majority of the reductions in extras concerned hot-rolled sheet and strip and stainless sheets. Toward the end of June most of the activity centered in the reduction of base prices on plates, and these almost entirely reflected the fading out of premium quotations.

Pull Furnace Fires in Strike

BECAUSE of a 10-month strike the American Zinc, Lead & Smelting Co. has pulled the fires from its roaster kiln and furnaces and eliminated 450 jobs at its Fairmont City, Ill., plant. The furnaces could not be used again without expenditure of \$1 million and six months' restoration work.

Since the strike was called by the International Union of Mine, Mill & Smelter Workers—CIO on Aug. 13, 1948, the company had kept the furnaces hot in hope that the strike could be settled and work resumed. The company contended it could not legally negotiate a contract with a

union whose leaders had not signed noncommunist affidavits.

Wage Data Considered

U. S. Steel subsidiaries studying data submitted by union in drive for increases

WRITTEN statements supporting requests of the United Steelworkers of America—CIO in its current contract negotiations with the United States Steel Corp.'s six steel-producing subsidiaries are being studied by the latter.

The written material was sent to the employers last week by the union as a follow-up to initial bargaining sessions during which the steelworkers verbally presented their demands.

After receipt of the union's written presentation, the corporation suggested that it and the union resume conferences at 2 p.m. July 6 in Pittsburgh. The union accepted.

Submit Statistics—Included in the written material were statistics through which the steelworkers endeavor to show the possibility of granting a "substantial wage increase." The union has not yet made a specific cents-per-hour wage increase demand. Also presented were a breakdown of costs for social benefit demands and data on estimated cost of a company-financed pension program the union wants.

It has been indicated U. S. Steel Corp. and other steel producers will hold to their original position that under wording of their present contracts pensions are not a subject for current negotiations.

In event a general strike in the steel industry soon after July 15 one company that might not be affected immediately is Allegheny Ludlum Steel Corp., Pittsburgh. That company's labor contract is not reopenable until July 15.

To Hold Negotiations—The Allegheny Ludlum contract is reopenable on the basic provisions of rates

PIG IRON AND FERROALLOY PRODUCTION FOR MAY AND YEAR TO DATE

Blast Furnace Capacity and Production—Net Tons										May-1949
DISTRIBUTION BY DISTRICTS:	Number of companies	Annual blast furnace capacity	PRODUCTION							
			PIG IRON		FERRO MANGANESE AND SPIEGEL		TOTAL			
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Percent of capacity	
									Current month	Year to date
Eastern	12	13,353,580	1,078,745	5,323,590	29,399	x 149,113	1,108,144	x 5,472,703	97.7	99.0
Pittsburgh-Youngstown	17	26,625,920	2,067,625	10,476,273	27,611	107,415	2,095,236	10,583,688	92.6	96.0
Cleveland-Detroit	6	6,984,600	523,796	2,821,998	-	-	523,796	2,821,998	88.3	97.6
Chicago	7	15,655,390	1,156,367	5,757,955	4,280	4,280	1,160,647	5,762,235	87.3	88.9
Southern	9	5,010,060	427,004	2,059,367	7,254	35,131	434,258	2,094,498	102.0	101.0
Western	4	2,912,300	194,525	1,087,651	-	-	194,525	1,087,651	78.6	90.2
TOTAL	37	70,541,850	5,448,062	27,526,834	68,544	x 295,939	5,516,606	27,822,773	92.0	95.3

* Adjusted.

of pay and social benefits, with the additional provision that it can also be reopened for discussion of amendments of the administrative provisions of the wage section dealing with procedures to be followed in determining rates of pay for new or changed jobs. The company has notified the union it wants to discuss changes in these procedures.

Negotiations between the bituminous coal mine operators and the United Mine Workers were recessed last Thursday until July 12 after the union's chieftain, John L. Lewis, ordered a three-day work week at all soft coal mines east of the Mississippi. He told the miners to return to work July 5 at expiration of their ten-day paid vacation and to produce coal three days a week until further notice.

The operators' contract with the UMW ended June 30 but Mr. Lewis said his miners would stay on the job for a short work week "to remove stresses and strains on industry and the public."

Price Bill Advances

Speedy House passage of delivered price measure now appears certain

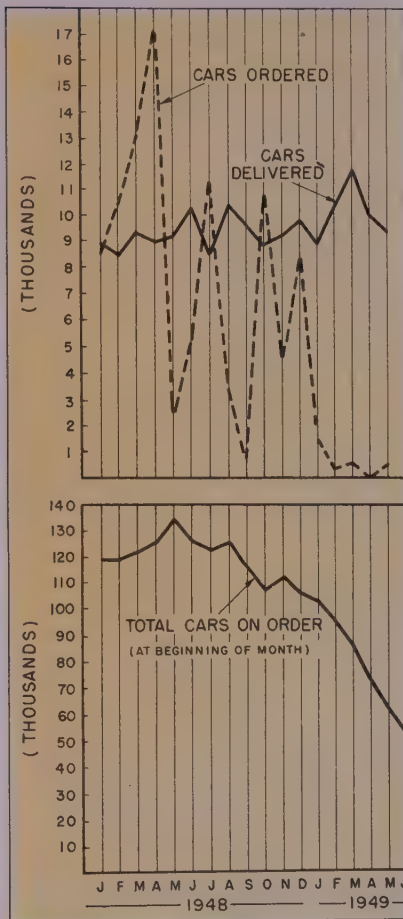
DESPITE a delaying action in the form of a new series of hearings launched by Representative Wright Patman of Texas, it now appears the O'Mahoney delivered price bill will be passed speedily by the House. The Rules Committee has approved consideration of the measure and indications are it will be enacted into law without any particular delay.

Representative Patman ran into a stone wall in seeking deferment of consideration by the House. He sought to have action delayed until his Small Business Committee had completed hearings on the matter. These were started only last Tuesday and it was believed would take two to three weeks for completion. However, Patman's arguments didn't get anywhere with the House Rules Committee.

Mr. Patman said passage of the O'Mahoney bill would cut the heart out of the Robinson-Patman Act by giving large buyers advantages over small ones, and his first witnesses—representatives of the United States Wholesale Grocers' Association—supported this view.

But no explanation was given as to just how this situation would be brought about by the O'Mahoney bill, even though Rep. Charles A. Halleck (Rep., Ind.) pointed out that freight

FREIGHT CAR TRENDS



Continued high output of railroad freight cars and a sharp decline in new ordering, as indicated in upper portion of chart, are cutting down the backlog of orders, as shown in lower part of chart. To fill the postwar surge of demand for new rolling stock, car builders set a production goal of 10,000 cars a month and either nearly equaled or exceeded it throughout 1948 and the first five months of 1949

absorption gives just as much advantage to small consumers as large ones.

Senator O'Mahoney, in a Chicago address on June 22, pointed out how serious the consequences would be of further delay in enactment of some measure that would take business men "off the hook." He said that the recent Supreme Court 4 to 4 decision in a case relating to pricing proved to him that the time had definitely come for Congress to clear away the ambiguities in court pronouncements, statements of the Federal Trade Commission and other government departments.

Confound Confusion—Enactment of a moratorium bill, aimed at giving

Congress more time to study the pricing situation, he asserted, would only "confound the confusion." Enactment of his bill, however, would be no success unless businessmen and government people know what they want to promote. The dangers of managerial government and of managerial industry which fail to take into consideration the effect their actions have on the masses are not "too far away." The system of delivered prices and of freight absorption which although it had grown up partly as the result of actions of those who were trying to take advantage of the consumer was nevertheless a system with which all concerned were familiar, and the upsetting of this system has profound effects; at the present time anything disturbing the economy so greatly promotes widespread unemployment.

Freight Car Orders Shrink

SUSTAINED high production, along with a sharp drop in new ordering, has whittled the backlog of orders for railroad freight cars to less than half of that existing Jan. 1.

On order at the beginning of June, according to the American Railway Car Institute, New York, were 52,281 cars, approximately one-half the 103,896 on order Jan. 1. With current ordering at a very low rate and with production high, the backlog is continuing to shrink. At the May rate of output, 9525 cars, the backlog constitutes approximately five months' production. Of the 52,281 cars on order June 1, car builders were to produce 27,931 of them and railroad shops, 24,350.

High point of backlogs was hit on May 1, 1948, when 134,676 freight cars were on order. Since last November, declines have been continuous. Deliveries of new freight cars attained a peak of 11,910 in March, 1949, but have been declining since with the easing in pressure for new rolling stock.

Truck Tonnage May Level Off

TONNAGE hauled by Class I intercity truck lines in the first quarter of 1949 increased 4.1 per cent over the like period of last year to establish an all-time first quarter record. An analysis by American Trucking Associations Inc., however, indicates that truck volume has leveled off and may be entering a decline.

Beginning in April, 1946, the trucking industry's volume increased for 34 consecutive months, but last February it declined 0.5 per cent from the same month of 1948. In March it increased 0.9 per cent from March,

1948, but in April it fell 3 per cent. During the 1949 first quarter ATA's index of truckloadings (1941 first quarter = 100) edged to 184, compared with the 1946 first quarter index of 121.

Taconite Development

Urged by proponents of Economic Expansion bill of 1949 through aid of subsidies

GRADUALLY diminishing reserves of high-grade iron ore on the ranges at the head of the Great Lakes are prompting suggestions in Congress of subsidies to ore producers to finance construction of beneficiation plants for the processing of taconite available in the area in large amounts. Suggestions are for inclusion in Economic Expansion bill of 1949.

Sen. Hubert H. Humphrey (Dem., Minn.) discussing the subject, cites a letter to Sen. James Murray from an executive of a prominent lake ore firm in which it is stated that 2500 million tons of iron ore have been taken from the Lake Superior district in almost 100 years, and that while exact reserves are unknown, latest accepted figures place the total at 1700 million tons, distributed according to the ranges as follows:

	Tons
Mesabi Range	1,200,000,000
Cayuna Range	117,000,000
Vermillion Range	15,000,000
Gogebic Range	58,000,000
Menominee Range	72,000,000
Marquette Range	110,000,000
Ontario, Canada	128,000,000
Total	1,700,000,000

And divided as to classifications as follows:

	Tons
Direct shipping open pit	766,000,000
Direct shipping underground	601,000,000
Open pit washed ores	333,000,000
Total	1,700,000,000

Estimates of production from the Lake Superior district to 1960 are:

1949	85,000,000
1952	81,000,000
1956	75,000,000
1960	67,000,000

This compares with actual shipments as follows:

1947	79,900,000
1948	84,700,000

Prediction is that decrease in production will come almost wholly from the Mesabi Range open pit direct shipping and washed ores. Production from other ranges combined should remain fairly constant, accounting for 20 million tons annually.

After 1960 ores which will replace the deficiency from the Lake Superior district can come from: 1. Magnetic iron-bearing material from the eastern end of the Mesabi Range. 2. Chile, Venezuela, Brazil, Sweden and Labrador.

It is suggested that 30 to 50-year



IN SHE GOES: Hitting the water is the hull of the Wilfred Sykes, world's largest iron ore carrier, in its launching last week at the Lorain, O., yard of American Ship Building Co. Being built for Inland Steel Co., Chicago, the Sykes is 678 feet long and will have a cargo capacity of 21,500 tons. Among other noteworthy features of the vessel are its speed and its comfortable quarters for the crew. The freighter's trial run likely will be held late in the fall, with delivery scheduled for the opening of the 1950 ore shipping season. NEA photo

loans at 2.5 per cent interest be offered to taconite interests.

Noting that it would take four to five years to build a plant to process low-grade ore and the capital investment for a plant capable of producing 100 million tons annually would be \$150 million, proponents urge that loans be repaid on a production-of-ore basis.

RFC Rejects Lone Star Loan

RECONSTRUCTION Finance Corp. last week rejected the bid of Lone Star Steel Co., Lone Star, Tex., for a \$74,103,000 loan. The federal agency indicated, however, that if Lone Star can raise 50 per cent of the necessary capital, the RFC will consider loaning the remainder.

Silicon Alloy Production Rises

ESTABLISHING a new record high for the third consecutive quarter, production of silicon alloys in the first quarter of 1949 increased 9 per cent over the previous period, according to Bureau of Mines. Production of all grades of silicon alloys totaled 239,445 tons in this quarter compared with 219,839 tons in the fourth

quarter of 1948. Shipments from plants producing silvery pig iron, electric furnace ferrosilicon and other silicon alloys amounted to 67,787 tons, 128,038 tons and 21,029 tons respectively. Blast furnace silvery pig iron output was less than in the previous quarter, and the other two were larger.

Chromite Imports Decline

IMPORTS of chromite in the first quarter of 1949 were less than in any quarter since fourth quarter of 1947 but 37 per cent higher than consumption, Bureau of Mines reports. Supply of chromite was 306,392 tons, and consumption was 236,017 tons. Domestic production accounted for only 152 tons which came from one mine in California and two in Oregon. Consumption of chromite remained virtually unchanged from fourth quarter of 1948. A sharp decline in receipts from Russia and a temporary drop in Turkish shipments accounted for a drop of 60,316 tons in the first period of 1949 under the previous quarter. Philippines Republic, supplying 30 per cent of total chromite imports, became the largest supplier of chromite to the U. S.

ASTM Holds 22 Sessions

Radiography, ultrasonic testing, fatigue of metals, etc. discussed at 52nd annual meeting

BESIDES 22 formal technical sessions, numerous committee meetings for refining specifications and officer elections highlighted sessions of the American Society for Testing Materials at its 52nd annual meeting in Atlantic City, N. J., the week of June 27.

Radiography and ultrasonic testing, fatigue of metals, rapid identification of metals, corrosion and fatigue of nonferrous metals, testing cast irons, steel and ferroalloys, and evaluation tests for stainless steels were among the more than 100 topics discussed formally and informally during the technical get-togethers.

Marburg Lecture—In presenting the Marburg lecture early in the week, W. M. Baldwin Jr., research professor and director of the metals research laboratory of the department of metallurgical engineering, Case Institute of Technology, Cleveland, described experimental methods used to evaluate residual stresses in metals. He discussed in detail how these stresses developed and explained fundamental differences in the mechanisms by which residual stresses are developed by cold working operations and by various heat treatments.

During the meeting, J. G. Morrow, metallurgical engineer, Steel Co. of Canada, Hamilton, Ont., was elected president of ASTM for the 1949-1950 period. New vice president for a term of 2 years is F. E. Richart, research professor of engineering materials, University of Illinois, Urbana, Ill.

Board Nominees—Nominees elected to serve on the board of directors for 3 years were: R. D. Bonney, assistant manager of manufacturing, Congoleum-Nairn Inc., Kearney, N. J.; C. H. Fellows, head, Chemical Division, research department, Detroit Edison Co., Detroit; H. F. Gonnerman, assistant to vice president in charge of research, Portland Cement Association, Chicago; N. L. Mochel, manager, metallurgical engineering, Westinghouse Electric Corp., Philadelphia; and M. O. Whitney, dean of engineering, University of Wisconsin, Madison, Wis.

Electroplaters Optimistic

ELECTROPLATERS, who through technical advances and modernization of facilities have placed themselves in an excellent position to fulfill American industry's require-



J. G. MORROW

ments, show little apprehension over long-term business prospects.

This was evident at the thirty-sixth annual convention of the American Electroplaters' Society, at Milwaukee last week.

Captive electroplating shops, it was reported at the convention, are operating at higher levels than jobbing shops.

The society's 1950 convention will be held at Hotel Statler, Boston, June 11-15, and will be designated as the fourth international "Conference on Electrodeposition," with the Electro Depositors' Technical Society of Great Britain collaborating. The 1951 convention will be held at Los Angeles, June 10-14.

General Refractories Opens Lab

OPENING ceremonies were held last week at the new refractories research and development laboratory, Baltimore, of the General Refractories Co., Philadelphia.

Included among the laboratory's principal current objectives are the development of the all-basic open-hearth furnace and necessary auxiliary processes thereto, whereby it is expected the production of open-hearth steel will be increased up to 30 per cent. Some phases of this project have already passed the pilot plant stage with outstanding results. Other phases, still in the development stage, will be speeded up by the availability of the new research facilities.

The new research center has complete chemical and physical facilities for studying refractories in all stages.

Steel Mill Equipment

Tentatively ordered for large French project financed in part with ECA funds

TENTATIVE approval reportedly has been granted for earmarking \$49 million of ECA funds for hot and cold-rolling steel mill facilities in France. A combination of nine French concerns have formed a steel plant operating subsidiary known as "Sollac" and are expected to expend large additional sums for construction of a large steel works.

The ECA funds will be spent on a 5-stand 46-inch tandem cold reduction mill for production of sheets and tin plate; a hot strip mill; and necessary electrical drives and auxiliary finishing equipment. Mesta Machine Co. has been tentatively awarded the cold mill, United Engineering & Foundry Co. the hot strip mill, while electrical equipment has been awarded Westinghouse Electric Corp., and Wean Engineering Co. is expected to provide pickling equipment and several cleaning and shearing lines. The hot strip mill is to have a capacity within the range of 700,000 to 850,000 tons annually, and the cold strip mill about 350,000 tons.

Other Program—Another important program likely to be acted on before the year is out involves two large integrated steel mills for India; also a large synthetic fuel plant and hydro power generating facilities. This program, designed for speeding up industrialization of India, is said to involve orders totaling close to \$700 million for the capital goods industries in the United States.

Engineers representing the Koppers Co., Pittsburgh, recently completed an elaborate economic survey for the Indian government. Other engineering organizations, including Arthur G. McKee & Co., Cleveland, and International Engineering Co., London, have also been retained as consultants. The latter firm is reported to have received a contract for expansion of the Tata Iron Works in northern India.

New Indian Plant—The first integrated steel plant scheduled to be built under this program probably will have a rated capacity of 500,000 tons annually of finished products, mainly shapes and plates, and will be located at Pandula in central India. The program includes another mill to be constructed at a later date. The proposed synthetic liquid fuel plant would have a rated capacity of around 375,000 tons.

Cutting Tool Sales Lag

Buyers sit tight pending clarification of business picture. Automotive and aircraft good

CUTTING tool manufacturers report their current business problems closely parallel those of other industries. Would-be customers just aren't buying until they see which way business is heading.

The amount of business being transacted by manufacturers and distributors of cutting tools depends a lot on the types of customers being served. Those who do a large portion of their business with either the automotive or aircraft industries are better off than the less fortunate ones who have neither of these customers.

Auto Trade Guarded—Since the automobile builders are bucking the tide and boosting production while everyone else is cutting down, tool suppliers all get a misty-eyed expression as they look toward Detroit. Unfortunately, the suppliers who have the business in the motor capital know a good thing when they see it and aren't letting any tyro get his foot in the door.

So, the "outs" contemplate their large inventories and tighten their belts as they try to do what everyone else is doing—cut down on inventories. All of which makes for a very unhappy situation because the would-be customers too are not buying anything that they can do without.

Some midwestern suppliers of cutting tools cautiously state business in the last two or three weeks has not been "too bad" but hurriedly add that they have no idea just how long this improvement will last.

Costs Still High—As for prices, the makers of cutting tools say that major price reductions are out of the question. Their contention is cutting tools did not increase in price in relation to other items and, therefore, cannot be expected to come down while costs remain high.

In the carbide tool line, Carboloy Co. Inc., Detroit, has announced reductions averaging 20 per cent and ranging up to 30 per cent on its line of standard round hole dies for wire, bar and tube drawing.

Equipment Demand Backlog Huge

REMAINING backlog of demand for durable equipment, plus the continuing need for replacement and growth, is a major element of strength, according to a study by the U. S. Department of Commerce. Level of equipment outlays necessary to main-



LOOKING SOUTH: Supplying American machine tools and "know-how" to Latin American nations in keeping with President Truman's Point Four program for aiding underdeveloped areas is the aim of Amertool Services Inc., Cincinnati, a company organized by 11 leading American machine tool builders (STEEL, June 20 issue, p. 75). Amertool officers, seated left to right, are: First vice president, S. A. Brandenburg, Monarch Machine Tool Co., Sidney, O.; president, Nelson F. Caldwell, Cincinnati Milling Machine Co., Cincinnati; and second vice president, J. C. Hebert, Jones & Lamson Machine Co., Springfield, Vt. Standing, treasurer, R. M. Lippard, Heald Machine Co., Worcester, Mass., and secretary, D. R. Weedon, Blanchard Machine Co., Cambridge, Mass.

tain facilities and provide for normal continued growth in productive capacity over the next decade is estimated between two and three times that of the 1920s, even after adjustment for price changes.

Though equipment outlays have been well above this level over the last three years, the excess has not been enough to exhaust the backlog of demand which existed at the end of the war, as a result of deferred growth and postponed replacements. However, it may take a lot of selling effort to persuade prospective buyers. Some prospective buyers may need to be convinced equipment is a desirable investment. They may think prices are unreasonably high or they may anticipate the opportunity to buy at more favorable terms a little later.

Cost-Reduction Factor — In the manufacturing industries the emphasis in the immediate postwar period was on plant expansion in order to have the facilities available for expanded demand. Relatively inefficient facilities have been continued in operation because they were

needed to satisfy the demand for end products and because, given the pressure of that demand, the prices charged could be high enough to cover the cost of operating the inefficient equipment. With return to more normal competitive conditions, there again will be a strong incentive to reduce costs by replacing such equipment.

Warner & Swasey Strike Ends

END of the strike at Warner & Swasey Co., Cleveland, in effect since last Dec. 27 resulted last week when members of Local 1253 of the International Association of Machinists voted to return to work and leave all issues to direct negotiations to be begun immediately.

A back-to-work movement started June 14 when several hundred employees of the machine tool firm returned to their jobs after receiving letters from the company stating that the plant would be reopened. The present agreement ends the 172-day strike, the longest in Cleveland's history.

No mystery connected with doing business with the Army and no outside contacts are needed to obtain orders, spokesman says commenting on reported charges of "influence"

"ANYONE who claims to be able to get business from the Army through use of 'influence' is making a claim which is in direct opposition to the manner in which the Army is set up to do business. There is no mystery connected with doing business with the Army, and no mysterious 'contacts' are needed."

That was the comment of Secretary of the Army Gordon Gray in reference to newspaper accounts charging a former lieutenant colonel who is now a management counselor in Washington with collection of payment from a Framingham, Mass., furniture manufacturer for assistance in landing an Army contract. The president of the furniture company is said to have paid the former colonel \$1000 and to have agreed to pay him \$500 monthly for expenses, and turn over to him 5 per cent of the gross amount of any contract he received.

Information Available — Secretary Gray pointed out that businessmen can get complete information on current procurement programs, submission of bids, buying and purchasing offices, etc. by writing the Procurement Information Center, Room 4E-789, The Pentagon, Washington 25, D. C., or telephoning it on REpublic 6700, Extension 4327, in Washington.

"Any person interested in doing business with the Army can find out from this center all he needs to know about Army procurement. No one else will be able to tell him anything in addition to what he can find out there. And it is quite possible that, by going to some other source for information, he will not be able to get all the information that he could get there. Once he has obtained his information from this center, the answer to whether he succeeds in selling his product to the Army is up to him, his product and his business efficiency," declared Mr. Gray.

Steel Escalation Allowable Cut

SIGN of easier times is the reduction in escalation stipulated in many of the commodity contracts placed by the armed services. Last fall when steel was tight, finished steel contracts were written with a clause permitting price increases up to 20 per cent of the contract prices

through June 30, 1949, and up to 30 per cent starting July 1, 1949. Now the steel escalation allowable maximum is 10 per cent. The new figure has been accepted by all steel companies excepting one which does not want to commit itself until it has concluded current wage bargaining.

The change in policy will give the armed services more flexibility in using their funds. With allowable escalation of 10 per cent, only \$110,000 will have to be kept in reserve against a \$100,000 steel contract as compared with \$120,000 to \$130,000 previously.

Suggests Airport Savings

WITH gross weight of passenger airplanes increasing an average of 7000 pounds annually over most of the last two decades, makers of planes and builders of airports need to study multiple-wheel landing gear more closely in order to save untold thousands of dollars now lost through premature obsolescence of landing fields, according to Walter R. Macatee, manager, Airport Division, American Road Builders' Association.

Still heavier aircraft are coming, Mr. Macatee predicts, pointing out that there has been a seven-fold increase in express and freight ton-miles flown in the United States since 1943. He cited the ton-miles flown in 1932 as 15,139,359, compared with 100,910,846 in 1948.

Not Alarmed Over Manganese

FAILURE to receive any Russian manganese ore during March and April has caused no alarm among government officials charged with the task of facilitating arrangements to insure availability of enough manganese ore to meet all United States requirements.

"Improved shipment — with prospects of further improvement—from India, the Gold Coast, Cuba, Brazil, Union of South Africa, Mexico, and other sources, plus increased shipments from domestic mines," an informed official told STEEL, "have altered the general situation to a degree where we no longer need to depend on the Russians."

"In addition," he went on, "there

is reason to expect that our requirements, in relation to a ton of steel ingots, will be reduced as a result of the conservation studies now under way."

Manganese content of general imports of the metallurgical grade of ore came to 116,971 net tons in the first quarter of 1949. In April, despite the absence of Russian arrivals, imports came to 49,955 net tons, or well above the first quarter average. This improvement is expected to be maintained.

No Change in Scrap Export Policy

NO CHANGE in the present policy of limiting ferrous scrap exports to 40,000 tons a quarter (not including shipments to Canada which are not limited) is in sight. Scrap dealers, pointing out that domestic sales are light, have asked the secretary of commerce to open-end scrap exports so that they may have a better chance of keeping their collection machinery intact. On the other hand, steel spokesmen have maintained that there is no real surplus of scrap in the United States and that therefore exports should be held to a carefully determined quota. There now is little chance of any further government action this side of the fourth quarter.

Steel Basing Point Briefs Soon

WHAT corporation lawyers think of the O'Mahoney bill which would legalize all delivered prices quoted in good faith to meet competitors' delivered prices should, if the bill becomes law in the meantime, be reflected by respondents' briefs in the Federal Trade Commission's action against the old basing point pricing system of the steel industry.

These briefs, to support respondents' motion for dismissal of the case, are due July 25. Under the O'Mahoney bill, if it becomes law, the commission would have to base its case entirely on proving conspiracy charges.

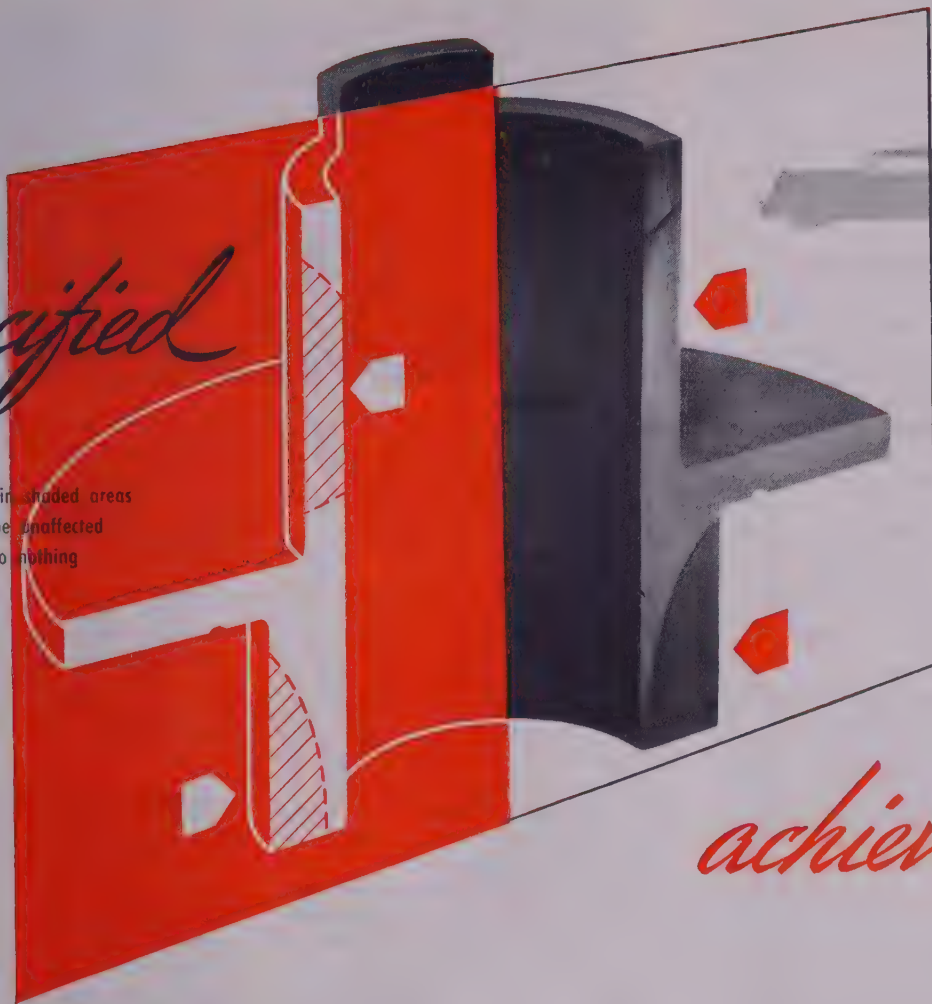
RFC Business Loans Gain

APPLICATIONS for RFC business loans have jumped 65 per cent since January to a total of 877 in May. This information came out during questioning of Harvey J. Gunderson, RFC director, before the Senate Banking & Currency Committee. He disclosed that RFC shows a profit of

another part for a torque converter transmission

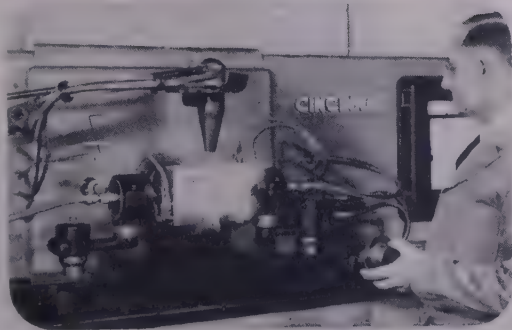
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\$10,635,000 on its operations during the 11 months since July 1, 1948. He explained that RFC makes loans only when capital cannot be obtained from private sources. Mr. Gunderson said that two of the angles RFC considers in deciding what action to take on loan applications is the effect on employment and the effect on small business.

Federal Payroll Increases

THE NUMBER of civilian employees in the executive branch of the federal government in April increased at the rate of more than 350 a day, according to the latest report of the Byrd Joint Committee on Reduction of Nonessential Federal Expenditures. With average federal pay at \$3000 a year, this means that the federal payroll in April increased at the rate of an additional \$1 million daily. Civilians in the federal employ in that month numbered 2,122,710, an increase of 11,453 over March.

Standard Sample List Issued

AN up-to-date list of standard samples issued or in preparation by the National Bureau of Standards is now available from the bureau's Publication Section. The bureau now issues more than 400 different kinds of standard samples, comprising materials of certified composition such as metals, ores, and ceramics; high-purity hydrocarbons; certain high-purity chemicals; paint pigments for color; oils for viscometer calibrations; melting-point standards; radioactive materials; and a number of reference standards, such as lamp, opacity, and reflectance standards. These standards have been established during the past 40 years to meet the constantly increasing needs of industrial and research laboratories.

Old Terms Give Way to New

THE OLD terms "by-product coke," "by-product coke ovens," "coal tar by-products," etc. now are quite obsolete as a result of co-operation by the Bureau of Mines, the American Coke & Coal Chemicals Institute and leading steel companies dating back to 1946 and 1947.

This change is called to mind by the latest report of the bureau's Anthracite & Coke Section, which uses the terms "coke," "slot-type coke ovens," and "coke and coal chemicals." STEEL's use of the new terms dates back to 1947, following a conference in which Sam Weiss, executive secretary of the American Coke & Coal Chemicals Institute, convinced



DEDICATED: Supersonic wind tunnels captured from the Germans in 1945, modernized and installed at the Naval Ordnance Laboratory, White Oak, Md., were dedicated last week. The tunnels were originally at Peenemunde on the Baltic sea and later moved to Kochel, Bavaria. In them the Nazis developed the V-2 rocket, and in November, 1948, Naval scientists set a world speed record—5.18 times the speed of sound

STEEL's editors that the new terms were well conceived.

This latest report by the Bureau of Mines, incidentally, shows the value of coke co-products produced in 1947 was 23.2 per cent of that of all coke-oven products while value of coke and coke breeze produced that year was 76.8 per cent—a ratio of approximately 1 to 3.

It contains much other information of value to the industry, gleaned from a study of industry trends.

Free copies of the report, by J. A. DeCarlo and J. A. Corgan, can be obtained by writing the Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh.

Bell Resigns OIT Position

SECRETARY of Commerce Charles Sawyer has accepted the resignation of George L. Bell, acting director, the Office of International Trade, but Mr. Bell has agreed to remain for a limited time pending appointment of a successor. Mr. Bell came to Washington from private industry in 1942 to work with the Board of Economic Warfare, and its successor agency, the Foreign Economic Administration. In the fall of 1945 he was transferred to the Department of Commerce where he has been director of the Division of Foreign Economic Development, director of World Trade Promotion, associate director and acting director of the OIT. In addition, during the past three years, he has represented the department on the Board of the Foreign Service, and has been chairman of the Board of Alternates of the U. S. Foreign Trade Zones Board. Before going into government work Mr.

Bell was vice president in charge of sales and director of the Caterpillar Tractor Co. for a number of years and also served as vice president and director of American Chlorophyll Inc.

Government Appointments

R. J. WYSOR, Charlotte, N. C., former president, Republic Steel Corp., Cleveland, has been engaged by the Economic Cooperation Administration to advise on the need for survey of Greece's steel requirements and resources. He has left for Paris to confer with ECA officials there and then will proceed to Athens to review the Greek government's estimate of steel needs.

John A. Poulin is the new head of the Foreign Branch, Interior Department's Oil and Gas Division. He has had extensive experience as petroleum engineer and geologist in Venezuela, Colombia and the British West Indies.

Forest Fire Prevention Drive

CHARLES E. Wilson, president, General Electric Co., headed a delegation of top business executives who came to Washington last week to rally public support in a nationwide drive to reduce the number of man-caused forest fires. Other business leaders taking part in the program included John L. Collyer, president, B. F. Goodrich Company; J. Spencer Love, chairman of the executive committee, Burlington Mills Corp.; J. P. Spang Jr., president, Gillette Safety Razor Co.; H. F. Willkie, vice president, Joseph E. Seagram & Sons Inc.; and Lee H. Bristol, president, Bristol-Myers Co.

Engineers Gird for Point Four Program

President's aid to underdeveloped nations means big engineering job. UN has \$86 million technical assistance program. U. S. to guarantee foreign investment profits

INITIAL phase of President Truman's Point Four program to aid industrially underdeveloped countries will call for U. S. engineering and research personnel and services on an unprecedented scale.

The United Nations, asked to assist in implementing the Truman program, is studying one project which envisages the spending of \$86.1 million over the next two years for technical assistance for underdeveloped areas. This sum is over and above what governments of recipient nations or mother countries are expected to pay as their part of the cost of technical assistance. Most, but not all, of this total would be spent for services and personnel provided by U.S. government and industry. Under the UN program, technical assistance would be given in industry, transportation, power development, government, labor, agriculture and health programs.

Speakers at the semiannual meeting last week of the American Society of Mechanical Engineers in San Francisco advised the profession to ready itself for a campaign to help spread the effects of America's "scientific revolution."

A new inducement for private U.S. investment abroad has been announced by Economic Cooperation Administration. The government now guarantees that foreign currency earnings in Marshall Plan countries and dependencies can be converted into dollars beyond the original amount invested. The new dollar convertibility limit has been placed at 175 per cent of the original investment, with the guarantee good for 13 years.

During its first year ECA guaranteed dollar conversion for private investments only up to 100 per cent of the amount invested, but Congress this spring voted an extension of the guarantee clause to cover profits as well, leaving it up to ECA to decide what percentage to approve.

United Kingdom

POINT Four program would involve three-way co-operation among the U.S., the home country and its overseas territories. Already underway is a series of informal discussions which the U.S. and the United Kingdom have had with the Union of South Africa involving problems in

producing uranium occurring in the South African gold ores. Uranium production in the area is expected eventually.

This dominion remains one of Britain's major customers for iron and steel and manufactured goods.

Although the U.K.'s steel production continues at record levels—a new high annual rate of 18,387,000 net tons of steel ingots and castings was chalked up in May—leading industries, particularly shipbuilding and automaking, press for larger allocations, notably for more sheets and plates.

The British locomotive manufacturers are operating at 100 per cent of capacity, although they are meeting foreign competition on a scale never before experienced. The domestic business, however, remains very large. Engineering firms are also very busy. Vickers-Armstrong, for example, has begun the manufacture of heavy mechanical presses for Russia on a contract which will require two years for completion. This is the first of a number of large Soviet orders for similar items expected by British companies.

Yugoslavia

EAST-West struggles may bring Yugoslavia under the Point Four program. Both technical "know-how" and equipment are badly needed to develop the nation's resources.

The Yugoslav capital equipment expansion program has been nearly derailed by the break with Russia—large equipment orders placed in the U.S.S.R. and Czechoslovakia have been cancelled—and Tito has begun placing new orders with western nations. A \$56.4 million trade exchange has been negotiated with France whereby Yugoslavia will get machinery in exchange for raw materials over the next 12 months. A supplemental \$94 million program has also been arranged for the next five years with the same types of goods traded. Another one-year trade agreement has been concluded with Sweden, calling for deliveries by each nation amounting to \$25 million. Swedish exports to Tito will include machinery, electrical equipment and paper, in exchange for Yugoslav copper, lead, corn, tobacco and hardwoods.

Tito is anxious for American as-

sistance in modernizing the valuable Trepcha lead mines in South Serbia. During the war the Germans exploited the property recklessly and since then the Yugoslavs have been struggling with outworn or outmoded equipment. Tito is also expanding his steel capacity and is looking for American aid. Steel output, which before the war was about 260,000 net tons annually, has exceeded this level. The target for 1951 is 835,000 tons, 1.1 million tons for 1952.

Bauxite is another Yugoslav resource, and an agreement has been signed with Miag Co., equipment maker in Western Germany, for construction of conveying and other equipment at a new aluminum plant. Other parts of the mill will be built by American companies.

Western Germany

FOREIGN investment funds are coming into Western Germany in increasing volume, principally by means of bartering foreign capital equipment for German products and foreign partnerships. The embargo on cash investments in German industry has not yet been lifted.

Nor is the dismantling problem yet solved. The British have begun tearing down Ruhr synthetic fuel plants, with worker protests and strikes resulting. In a desperate effort to save the August Thyssen steel facility near Duisburg, one of the most modern in Europe, the Germans have devised a "Youth Educational Self Help Work of Europe" plan whereby plant profits would be used to help European war orphans of all nationalities. The plan will be submitted to the foreign ministers. Some of the equipment from the Krupp plant at Essen which is being dismantled is going to Yugoslavia.

A large increase in the collection of iron and steel scrap has occurred in Western Germany since the currency reform. From June to December, 1948, 1,667,000 tons were collected and shipped to domestic steel plants and foundries; 133,000 tons were exported during that period. During the first four months of this year, 1.2 million tons went into domestic consumption and 673,000 tons were exported. The trend is declining slightly now, but dealers expect export and domestic markets will continue to require 400,000 tons monthly for at least the next 120 days.

France

SCRAP supplies are very easy now in France and prices have fallen about 40 per cent since the beginning of the year. Consumption averages

about 160,000 tons per month. More than 190,000 tons were on the market in May.

French mills turned out 890,000 tons of steel ingots and castings in May, equal to the monthly average for the record 1929. New orders, however, fell 20 per cent during the month, influencing a further price reduction in export quotations, which are now only slightly higher than domestic figures. Merchant bars and structurals are quoted at between \$90 and \$95 per metric ton, f.o.b. Thionville, for most overseas markets. The U.K. is getting French billets for \$78.50 per metric ton, f.o.b. Thionville.

Belgium

BELGIAN steel production is being voluntarily reduced because of less demand. Belgium, like the United States, finds itself in the embarrassing position of being a creditor nation. Countries like Argentina are turning to France for their supplies because France owes them money.

Home Gas Use Mounts in Decade

WITH 25,776,000 homes using gas for cooking on Dec. 31, 1948, the gas industry now serves 9,241,000 more homes than on Dec. 31, 1938, a 56 per cent increase. More than 1,690,000 new cooking customers were added to gas utility and LP (bottled) gas distribution systems during 1948 alone, according to Gas Appliance

Manufacturers Association Inc., New York.

During the past ten years, 3,690,000 additional families purchased electric ranges and brought the total of electric cooking customers to 5,840,000.

Better than 90 per cent of all homes on piped gas lines use gas for cooking, and about 64 per cent of all homes in the United States cook with either piped or with LP gas. Rural LP gas cooking customers total 4.7 million and have increased more than 800 per cent since 1938.

Film Shows Western Steel Gain

PREVIEWS of Bethlehem Pacific Coast Steel Corp.'s film "Steel Builds the West" in several cities last week indicated that a new pattern may have been established for industrial movies. Unlike many, it does little direct selling of "Bethlehem" but it does tell how steel is made and how it has helped U. S. citizens to attain an unparalleled standard of living. The 16 mm color and sound film was produced by New World Productions, Hollywood, and is recommended for showing before employee, civic, engineering and trade groups. Prints, free of charge, are available from publications department of Bethlehem Steel Co., Bethlehem, Pa., as well as from Bethlehem Pacific.

Employee Suggestions Grow

EMPLOYEE suggestion systems are

being utilized increasingly by metal-working companies to help meet buyers' market conditions with cost-saving ideas.

A survey of the Cleveland area reveals that now about 38 per cent of the firms queried have suggestion systems, compared with 34 per cent 18 months ago. Between 5000 and 8000 systems are in operation over the United States today, more than before the war, but slightly less than during the conflict.

Consensus among Cleveland firms is: Production gains from employee suggestions don't average more than 1 per cent, but the systems are worth keeping even for that 1 per cent, for the morale improvement and for the chance that the great idea may eventually come.

About 200 to 500 suggestions per year per 1000 employees is considered good. Suggestions are usually submitted on: Elimination of waste, improvement in product quality, improvement in operational procedures and methods, improvement in tool, production and handling equipment, better service to customers, simplification of forms or reports and improvements in safety and housekeeping conditions.

Standardize Contract Clauses

ARMY, Navy and Air Force soon will be using the same clauses in fixed-price supply contracts, thus making it easier to do business with the armed services, Defense Secretary Louis Johnson has announced.

Standardized clauses for use in fixed-price contracts initiated on or after Oct. 1, 1949, or executed on or after Jan. 1, 1950, will apply to equipment, arms, ammunition, fuel, materials, machinery, food and clothing.

Developed by a committee representing the military departments and approved by the Munitions Board, the procurement regulation incorporates recommendations by industry and reflects improvements suggested by experiences of the armed services and industry since the beginning of the war.

IOS Meets in Paris

INTERNATIONAL Organization for Standardization, composed of representatives of 17 countries, including the United States and Great Britain, met in Paris June 28 for a three-day meeting on the unification of the various national standards on screw threads.

American Standards Association represented the U. S. at the Paris meeting when the ball started rolling



BRIDGING THE GAP: Battling a stiff breeze, workmen lower a 37-ton I-beam into place 150 feet above Nason creek, Gaynor, Wash. The girder, 96 feet long and 8 feet high, spans the longest section of a 546-foot bridge being built for Great Northern Railway. NEA photo

for national standardization for boilers and pressure vessels.

Sales, Marketing Stressed

Porcelain enamellers told market planning as important as production plans

PRODUCTION facilities have outdistanced our market plans, D. H. Malcom, manager, Market Development Division, Armco Steel Corp., Middletown, O., told the third annual sales management conference of the Porcelain Enamel Institute, meeting June 24 in Carter Hotel, Cleveland.

More than 200 members and guests of the institute heard him say: "High quality and low cost mean profit only when the product is sold. We must consider market planning as important as production planning. In fact, we must realize that today it is more important because for eight years we have had aggressive production planning with very little being done to develop new markets or new marketing methods for our products."

Face Challenge—Mr. Malcom's remarks echoed those of A. J. Billingsley, president, Fuller & Smith & Ross, Cleveland, who told the conference: "We face a challenge as marketers not as producers." Marketing can and must be an orderly, sensible business, he said. Management must take marketing men into the fold, must make advertising and selling a basic part of business direction and must demonstrate its confidence in progressive marketing by willingness to invest time and money to do the selling job well.

Speaking on reconversion sales methods, John C. Sharp, vice president, Hotpoint Inc., Chicago, said there is a lack of competitive selling experience. Accenting efficiency of distribution rather than of production, he told the conference that a quarter of a million sales persons must be trained to sell appliances.

Discussing marketing activity at the retail level, Dr. Lawrence F. Greenberger, director of personnel training, Kaufmann Department Store, Pittsburgh, said the success of a product depends upon the manufacturer's ability to inform retail sales persons about the features and qualities of the product which fill customer needs and provide services the customer wants.

Cost and Design—William J. Russell, vice president in charge of research and development, Landers, Frary & Clark, New Britain, Conn., in talking about designing for sales in 1949, said cost must be kept uppermost in mind. We have gone

through a period of deluxe features, he added; we must incorporate competitive features but eliminate "gimmicks."

Margaret Davidson, associate editor, *Ladies Home Journal*, discussed the purchasing power of women. Her surveys of women's wants revealed desire for more color in kitchen appliances, porcelain enamel window sills, porch and nursery furniture and higher bathroom washbasins.

C. D. Clawson, president of PEI, keynoting the conference, likened the present sales picture to a poker game. The general public is ready to ante with the biggest savings accounts in history, he said, and industry must be ready to play the game with the greatest dollar value.

Urged To Join in Smoke Control

MUNICIPAL smoke abatement and air pollution control programs afford a major opportunity whereby the stoker industry can contribute to the public's benefit and also gain competitively.

Claude A. Potts, president of the Stoker Manufacturers Association which held its annual meeting in French Lick, Ind., pointed out that now is the time for the industry to bring its engineering skill to bear on the problem of smoke abatement. All stoker sales executives were in agreement that plentiful supplies of gas and oil, plus declining fuel oil prices and aggressive merchandising efforts from gas utilities and oil companies, spell keener competition among manufacturers of all types of automatic heating devices.

Mr. Potts, vice president of U.S. Machine Corp., Lebanon, Ind., was re-elected association president and board chairman for the ensuing year. C. T. Burg, vice president of Iron Fireman Mfg. Co., Cleveland, was elected vice president, and C. P. Meredith, executive vice president, Steel Products Engineering Co., Springfield, O., was re-elected secretary-treasurer. Marc G. Bluth was reappointed executive secretary.

Freedom Forum Meets July 11-14

NEXT meeting of the Freedom Forum, a series of gatherings in which industry is participating to discuss what can be done to preserve free enterprise, will be held July 11-14 at the University of Southern California, College of Aeronautics, Santa Maria, Calif.

This will be the third session of the forum which is sponsored jointly by Harding College, Searcy, Ark., and the Advertising Council. The latter group is backed by the Amer-

ican Association of Advertising Agencies and the Association of National Advertisers. Subsequent meetings are also planned for next fall and winter.

CALENDAR OF MEETINGS

July 11-16, Concrete Reinforcing Steel Institute: 25th anniversary meeting, The Greenbrier, White Sulphur Springs, W. Va. Wire Reinforcement Institute will meet July 11; Steel Joist Institute will meet July 12; American Iron & Steel Institute Committee on Reinforced Concrete Research will meet July 13; Rail Steel Bar Association will meet July 13; Concrete Reinforcing Steel Institute will meet July 14-16. Last group's headquarters are at 38 S. Dearborn St., Chicago.

July 13-15, American Society of Civil Engineers: Summer convention, Mexico City. Society headquarters are at 33 W. 39th St., New York.

July 14-15, Magnesium Association: Quarterly meeting, Hotel General Brock, Niagara Falls, Canada. Association headquarters are at 30 Rockefeller Plaza, New York.

July 15-24, South American Union of Engineering Associations: First Pan-American Congress, Rio de Janeiro, Brazil.

July 20-22, Pressed Metal Institute: Annual convention, Hotel Cleveland, Cleveland. Institute headquarters are at 13210 Shaker Sq., Cleveland.

July 22, Truck-Trailer Manufacturers Association: Midyear general meeting, Edgewater Beach Hotel, Chicago. Association headquarters are at 809 National Press Bldg., Washington.

July 28-29, American Foundrymen's Society: Annual directors' meeting, Chicago.

Aug. 10-12, Western Packaging Exposition: Civic Auditorium, San Francisco.

Sept. 9-12, Instrument Society of America: Clinic on maintenance of industrial instruments, Hotel Statler, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, Instrument Society of America: National conference and exhibit, Municipal Auditorium, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 15-16, Magnesium Association: Quarterly meeting, Hotel Statler, Detroit. Association headquarters are at 30 Rockefeller Plaza, New York.

Sept. 21-24, National Association of Foremen: 26th convention, Hotel Statler and Masonic Temple, Detroit. Association headquarters are at 321 W. First St., Dayton, O.

Sept. 25-Oct. 1, American Institute of Mining & Metallurgical Engineers: Midyear meeting, Neil House, Columbus, O. Details may be obtained from J. H. Melvin, Orton Hall, Ohio State University, Columbus, O.

Sept. 26-28, National Electronics Conference: 1949 conference and exhibit sponsored by Illinois Institute of Technology, Edgewater Beach Hotel, Chicago. Nathan Cohn, Room 1505, 307 N. Michigan Ave., Chicago, heads the exhibits committee.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Statler, Buffalo.

Oct. 3-4, National Association of Corrosion Engineers: South central regional meeting, Adolphus Hotel, Dallas, Tex. Heading the arrangements committee is G. R. Olson, United Gas Pipe Line Co., Shreveport, La.

Oct. 3-6, Association of Iron & Steel Engineers: Annual convention, William Penn Hotel, Pittsburgh. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Drake Hotel, Chicago.

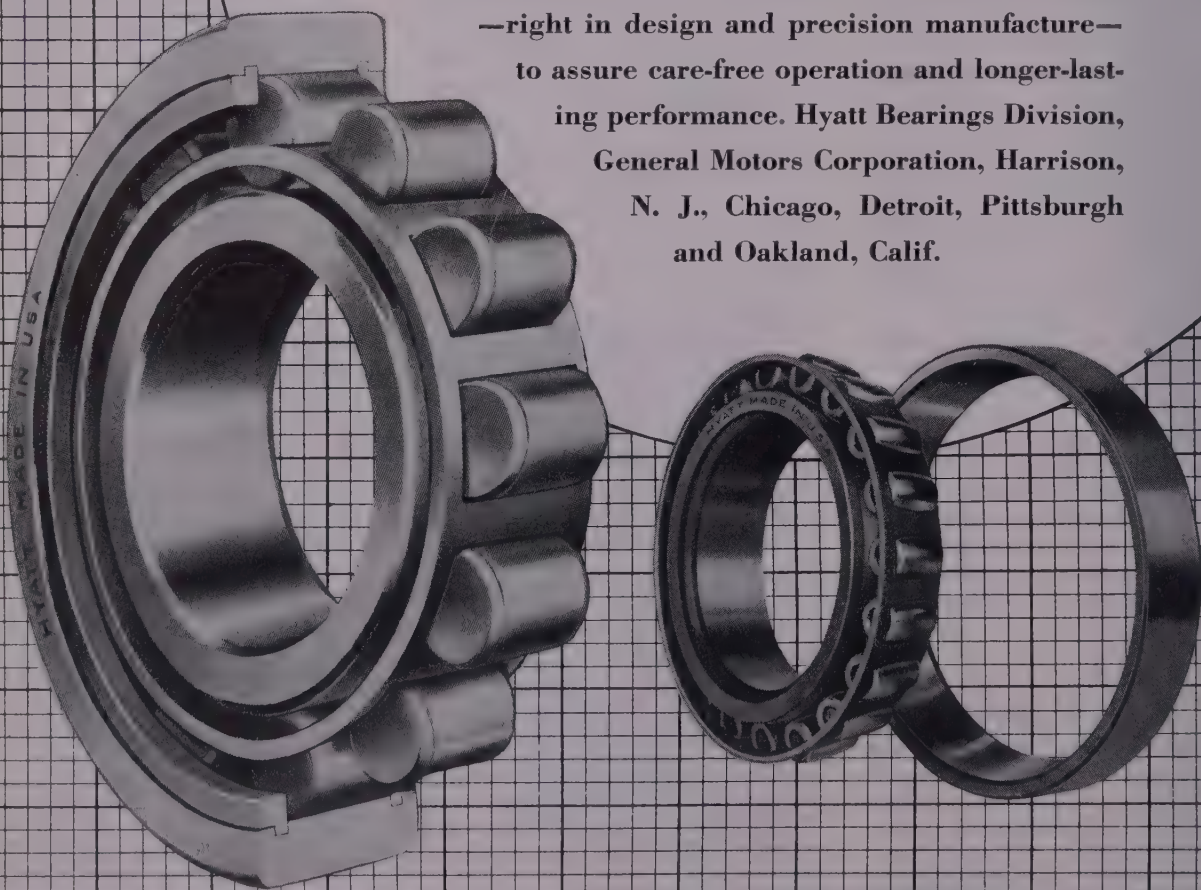
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HYATT ROLLER BEARINGS

Mirrors of Motordom

June sets new production benchmark in auto industry with output topping 600,000 units for first time since April, 1929. August may see first signs of slackening schedules

DETROIT

NOT in 20 years has there been the furious production pace in the automotive industry registered in the month just concluded when approximately 628,000 cars and trucks swarmed from assembly lines. In April, 1929, there were 663,811 units built, but not since that year has monthly output crossed 600,000, so June of 1949 sets a new benchmark for modern times and it is not likely the figure will be equaled again this year, or perhaps for some time to come. July has fewer working days and August may see the first signs of slackening production schedules which are figured to ease off still further in the fall.

The first six months of the year saw about 3,140,000 vehicles assembled. Passenger cars soared 610,000 over the same period a year ago, although 94,000 fewer trucks were built, attesting to the slow return of a buyers' market in commercial vehicles. The combined total far exceeded predictions being made at the turn of the year. The remarkable thing is that the exceptional volume was realized in spite of scattered strikes, slowdowns and other labor-inspired interruptions. Ford alone lost output of 110,000 cars and trucks because of the 27-day strike at the Rouge plant.

The road is clear to a continuation of peak automotive production. Materials are in comfortable supply and their cost is down somewhat, pointing to the possibility of a better margin for further price reductions this fall, if the market should lag to the point where a shot in the arm may be necessary. A number of plants still have some inventory of high-cost steel on hand, carrying over from the time when conversion arrangements were necessary to balance out stocks. However, this material is being worked off as rapidly as possible and in 30 days it should be a thing of the past.

Tool and Die Business Better

TOOL and die business in the Detroit area has shown a slight pickup from the low ebb experienced earlier this year, although it is getting to be a

dog-eat-dog proposition. A set of fender dies, normally in today's market running to perhaps \$200,000, was taken on by a local shop the other day at a bid of \$120,000. Another large die job, quoted at \$90,000 by one shop, went to another for \$60,000. Such substantial cuts are hard to understand in the face of continuing high labor costs, labor being possibly

Automobile Production

Passenger Cars and Trucks— U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	628,000*	454,401
Six mos.	3,138,366*	2,617,581
July		489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
June 11	137,013	109,831
June 18	146,056	109,259
June 25	150,659	109,259
July 2	145,000	95,027

Estimates by
Ward's Automotive Reports

90 per cent of the total cost. Doubtless the reasoning is that it may be better to take on jobs at a loss and keep the plant going than to close the doors. It is often possible to sandwich smaller so-called "gravy" jobs into a major contract with enough profit in them to offset the loss in the larger task.

Overcapacity is the principal trouble with the Detroit-area tool, die, jig and fixture industry which has expanded 100 per cent over the 1938 level. Recent report submitted by 88 shops belonging to the Tool & Die Manufacturers Association

showed employment of 3717, comparing with 4962 a year ago, and 126,000 hours worked in a week, compared with 190,000 hours a year ago. Average work week was 34 hours, against 39 hours last June. Average wage rate for production personnel, including overtime where it was required, was \$2.375 an hour, against \$2.23 a year ago. Unions are now submitting new demands for higher pay, including pensions, health insurance and cost-of-living increases totaling 43 cents an hour. This amounts to an 18 per cent boost and operators see no possibility of meeting it, particularly in view of the dim prospects for any appreciable improvement in business volume, plus the pressure on prices.

One of the problems faced by the larger die shops is that they are hemmed in by union restrictions on seniority, hours of work, overtime, etc. to the point where they lose jobs to smaller competitors which may employ only 5-10 men who will work almost around the clock if necessary. Even the owners of these small "alley" shops will often take off their coats and pitch in on a rush job, and they can come up with quotations on work the larger units cannot touch. On top of all this the available volume of business has further shrunk as a result of the big manufacturers keeping tool and die work in their captive tool shops which formerly was let out to the jobbing trade. Fisher Body, Ford, Briggs and Budd all have their own diemaking departments which can handle a large share of body die manufacture.

Wider Rear Vision Projected

RESTRICTED rear window area of current Hudson and Nash passenger cars, at least in comparison with, say, General Motors models, is due for a change in 1950 designs, with some tooling already in the works to alter roof stampings for much wider vision at the rear.

An Interesting Novelty?

DEMONSTRATION of Hudson's experimental 6-cylinder engine with compression ratio lifted to 9.3:1 by the simple expedient of milling 1/32-in. off the aluminum alloy cylinder head shows exceptional acceleration characteristics at speeds above 3 mph. Fuel required for the unit is 100 octane research gasoline, and

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until it becomes available generally Hudson engineers see little in the high-compression engine except for an interesting novelty. They are inclined to minimize the importance of high-compression for practical purposes today, feeling that oil companies are going to be slow to bring to the market the requisite fuels. Stuart G. Baits, Hudson vice president in charge of manufacturing, hazarded the guess that octane numbers might be counted on to increase by one point a year, which would mean that 15 years or more might elapse before 100-octane fuels would be on tap at service stations.

Hudson's claim that its present 6-cylinder L-head engine is structurally strong enough to be modified for 12.5:1 compression ratio contrasts strangely with the major redesign which General Motors engineers have determined to be necessary to handle the higher compression ratios. At any rate, Hudson appears perfectly satisfied with its present 6 and 8-cylinder engines, being confident their adaptation to higher compression will be a relatively simple matter.

The economics of high compression still are cloudy. If, for example, a 30 per cent gain in economy can be achieved by raising compression to 12.5:1, but at the same time the fuel costs 30 per cent more, the net gain is nil. Only when the high-octane gasolines are available at a modest premium will there be a saving possible by stepped-up compression ratios.

Buick's Fancy Job in Production

BUICK'S fancy sport job, the Riviera, a convertible chassis with a steel top mounted there, is in limited production, Buick being the first of the General Motors Divisions to introduce this novel body type. Distinctive feature is the greater use of glass and the absence of center posts. The rear window comes well into the quarter panels and also reaches up into the rear roof section. Windows are controlled by pushbuttons and when lowered the entire side of the car from roof to belt line is open. Sides of the body are ornamented with an unusual sweep spear molding of chrome plated steel which starts as a narrow triangular section just ahead of the front wheels and extends through to the end of the rear fender, flattening out and widening to blend with the fender gravel shield.

Press preview of the new Buick Special has been moved up to July 19, and first shipments of the new body style were made by Fisher Body last week. The car is described by Buick publicists as beyond descrip-



CUTTING DEADWEIGHT: Truck trailers for the transport of automobiles are built for maximum strength, rigidity, resistance to fatigue and for maximum reduction in deadweight. High-strength steel is used for most parts. Photo shows a unit under construction at Mechanical Handling Systems Inc., Detroit, which will weigh 7000 pounds when completed. If built of mild steel, the unit would weigh 9000 tons

tion because "there is nothing with which to compare it," and it will be priced "just a moderate sum" above the lowest-priced cars on the market today.

Kaiser Assembly Plants Next?

KAISER-FRAZER is toying with the idea of setting up something like 1000 small assembly plants scattered throughout the country, each capable of turning out 20 cars a day. Experimental units now are under construction in Los Angeles and Portland, Oreg., and if successful they will be extended to other areas. Theory behind the proposal is to improve labor relations by decentralizing operations into small units.

Wraps Off Reo Truck Engine

REO MOTORS Inc. at Lansing, Mich., has taken the wraps off a new "Gold Comet" heavy-duty 6-cylinder gasoline truck engine, developing 140 hp at 3200 rpm and using the wet sleeve principle of construction, with removable cylinder liners. A three-year \$1.5 million program of research and development, plus the installation of \$3.5 million worth of machine tool equipment, has preceded manufacture of the power plant. It has 331 cu in. displacement and a square bore and stroke ($4\frac{1}{8} \times 4\frac{1}{8}$). Other

features include an integral manifold and cylinder head, sodium-cooled exhaust valves, seven-bearing crankshaft with induction hardened journals and pins, and the Houde viscous vibration dampener. Sleeves come in direct contact with cooling water in the block and are kept permanently watertight by an overlapping engine block gasket and two neoprene seals at the lower end.

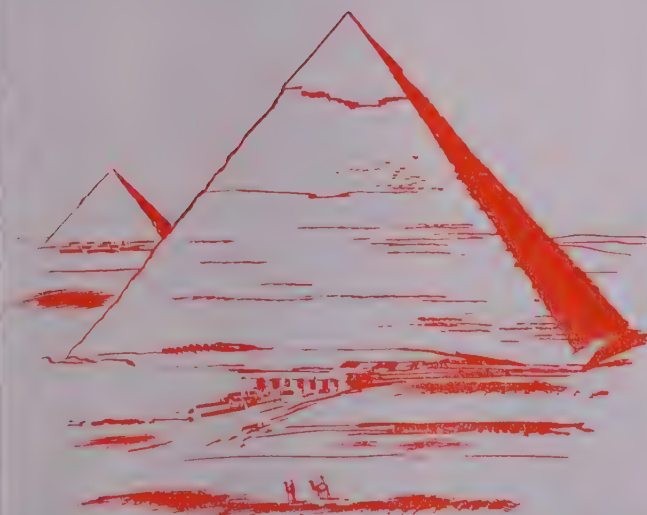
A four piston ring combination has been worked out, with three rings above the piston pin and one below. Pistons are bronze plated to minimize cylinder wall scuffing during break-in. Compression ratio is 6.4:1.

Reo will use the engine to power a fleet of 5000 trucks of $2\frac{1}{2}$ -ton capacity which the company will build for the Army Ordnance Department. Contract covering the trucks and a large quantity of spare parts, runs to \$41 million, rather a windfall for a company whose total business last year was around \$38 million. Recently a substantial RFC loan was negotiated to cover cost of new equipment required for building the engine. Deliveries on the Army contract will start next March.

A new series of heavy truck models is being introduced concurrently by the Lansing manufacturer. They are in the 17,000-22,000 pound range and feature completely redesigned chassis and cabs.

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will maintain permanence of the assembly...
help you get *True Fastener Economy.*

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progressive development in rivet
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Pa., Rock Falls, Ill., Los Angeles, Cal.
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Detroit, Chicago, Chattanooga, Oakland,
Portland, Seattle. Distributors from coast
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Boosts Incentive Plan

President of Youngstown Alloy saw production double without adding to work force

INCENTIVE plans can pay off for both employee and employer. This is a firm conviction of Jack Trantin Jr., president, Youngstown Alloy Casting Corp., Youngstown.

Mr. Trantin has watched production in his plant, a small steel foundry, double and even triple without any increase in number of employees since a profit-sharing plan was installed several years ago.

Furthermore, the plant has been free of labor-management disputes and its smooth operation has enabled Mr. Trantin, a metallurgist, to devote more of his time to the development of the new products and better steels, a number of which have passed the development stage and are ready for release.

Employees Share Profits—A few years ago, Mr. Trantin was beset by the usual postwar management difficulties—too many orders, labor shortages, low labor productivity and general employee dissatisfaction.

The company then offered the workers 10 per cent of the gross profits, in addition to their regular pay. The results, says Mr. Trantin, were startling. The men worked harder and faster and were more careful of quality. Output the first month under the incentive plan was doubled without a single man being added to the force.

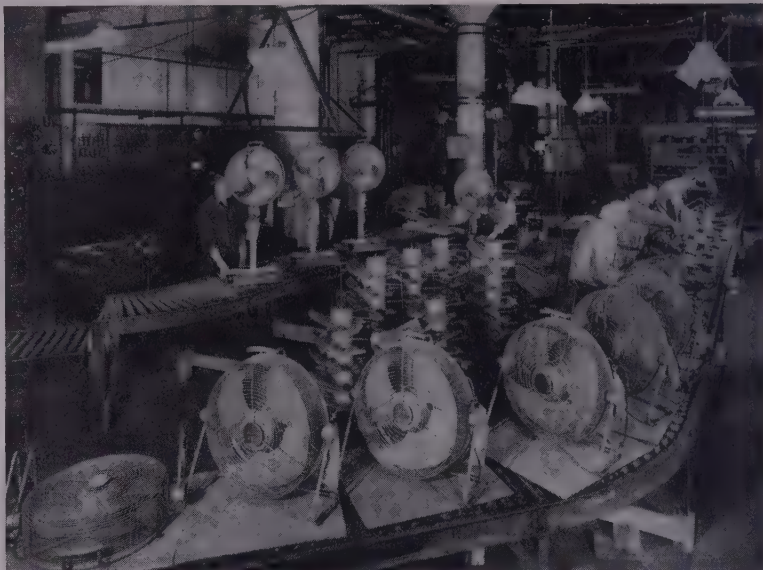
Today, output is running about three times the pre-profit-sharing plan rate.

Broadens Bonuses—Later, the company increased the Christmas bonus paid workers by adding \$25 for each year of service. Still later another production bonus was added, the company putting \$25 into the employees' kitty for each \$1000 increase in production. Today many of the workers are making \$5000 or more annually.

Then Mr. Trantin told his workers that it was up to them to decide when new workers should be added to the payroll. They could decide how many and who were to be hired.

"The boys preferred to work a little harder and keep the proceeds in the family" rather than increase the work force," says Mr. Trantin. "When there's extra work to be done, they pitch in and do it, even though it entails evening or Sunday work."

"The foremen have no trouble with the employees. As a matter of fact, the foremen pitch in and take a hand



FAN ASSEMBLY: Sections of Ilg Electric Ventilating Co. fan assembly lines are shown above. Motor is assembled on fan frame, guard mounted on frame and the complete unit placed on the bar arm supports. Units move on conveyors from right to left, passing into shipping department where each fan is packed in an especially designed carton ready for shipment from the firm's Chicago plant

in the work themselves. They are all working for themselves."

Youngstown Alloy Casting Corp. was founded by Mr. Trantin 12 years ago. The company specializes in high-grade alloy steel castings, particularly bar mill guides for steel companies. Whereas many foundries are experiencing a serious slump in orders, this Youngstown plant has all it can handle.

A new \$100,000 plant is being constructed and the men are figuring on a way to move into the new plant with minimum operational snags.

McGraw Acquires Line Material

CONTROL of Line Material Co., Milwaukee, has been obtained by McGraw Electric Co., Elgin, Ill., in a deal involving exchange of stock of the two firms. Operations of Line Material, manufacturer of electrical transmission and distribution equipment, will be unchanged with W. D. Kyle Jr. continuing as president but Max McGraw, president of McGraw Electric, will succeed W. D. Kyle Sr. as board chairman.

Some of Line Material's production facilities at its Milwaukee plant and two South Milwaukee plants may be used in part for McGraw production. The Elgin firm's three plants prior to the latest acquisition were: Bussman Mfg. Co. Division, St. Louis, electrical devices; Clark Water Heater Division, Chicago, automatic elec-

tric water heaters; and Toastmaster Products Division, Elgin, household appliances.

Chicago Railroad Fair Opens

CHICAGO Railroad Fair, which attracted more than 2,500,000 visitors in 1948, reopened June 25 to continue through Oct. 2. Sponsored by the railroads of the country and located on Chicago's lake front, the 1949 fair is a revised and improved version of the 1948 event. Most exhibits of modern railroad equipment and motive power will be shown again and a number of new ones have been added. The popular "Wheels-A-Rolling" pageant, depicting the history of American transportation, has been revamped and improved and again is a main attraction. The pageant grandstand has been enlarged by 1000 seats so that 6000 spectators can be accommodated during each of four daily performances.

Ruger Builds Handling Plant

RUGER Equipment Co. Inc., Cleveland, manufacturer of hydraulic floor and truck cranes, expects to begin full operations by July 15 in a new manufacturing and assembly plant in Uhrichsville, O.

Ground was broken Apr. 4 for the new facility which is being built to help meet increasing demand.

Briefs

Paragraph mentions of developments of interest and significance within the metalworking industry

International Harvester Co., Chicago, is erecting a structure to house its Fresno, Calif., branch. The building will contain more than 10,000 sq ft of floor space.

American Fork & Hoe Co., Cleveland has become True Temper Corp. Besides producing eight lines of hardware products, the company makes fishing rods and golf shafts, marketed under the trademark, True Temper.

Bethlehem Pacific Coast Steel Corp. will install a 75-ton electric furnace in its Los Angeles plant in the near future. The furnace has a 20-foot hearth.

Warner & Swasey Co., Cleveland, machine tool builder, has made the following changes in sales office addresses: New England office to 20 Chestnut St., Needham, Mass., Humphrey R. Ward, manager; Buffalo office to 344 Delaware Ave., A. Sellers Jr., manager.

Sturgis Products Co., Sturgis, Mich., has changed its name to Roto-Finish Co. and moved all sales and manufacturing facilities to its new plant in Kalamazoo, Mich. The company produces Roto-Finish materials, equipment and processes for mechanical finishing.

War Assets Administration has approved extension of an existing lease by Western Electric Co., New York, of a Burlington, N. C., plant. Western Electric has been operating the facility for the manufacture of electronic equipment. Lease will run until Mar. 15, 1956.

Conlon-Moore Corp., Chicago, manufacturer of home appliances, has consolidated the sales departments of its Conlon and Moore divisions, with a new central sales office at the American Furniture Mart, Chicago.

Gray Iron Founders' Society, Cleveland, has appointed a safety committee to formulate an industry program, including preparation of a code of safe working practices for each foundry department.

Office of Technical Services, U. S. Department of Commerce, has available an illustrated manual, "Plastics Inspection," dealing with the nature

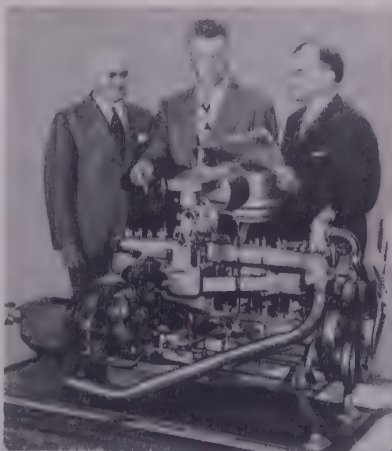
of plastics materials, their methods of fabrication, properties and tests.

Dravo Corp., Pittsburgh, has launched the last of a fleet of six 175-foot welded steel hopper barges, for Ohio River Co., Cincinnati. Fleet will transport coal.

Enameled Metals Co., Pittsburgh, producer of fittings and conduit, has named James T. Heagarty & Co., Philadelphia as sales representative for eastern Pennsylvania, southern New Jersey and Delaware.

Acme Chain Corp., Holyoke, Mass., maker of roller chain, has acquired an additional 7000 sq ft of floor space in the former American Writing Paper Corp. mill in Holyoke.

Export of 47,500 more tons of 30-31 in. welded line pipe to the Trans-Arabian Pipe Line Co. has been licensed. This quantity is in addition to earlier approval of 35,000 tons for second quarter of 1949. Of the total tonnage required for the thousand-



DISCUSS ENGINES: Latest advances in engine development by Hudson Motor Car Co. are discussed by Stuart G. Baits center, first vice president and general manager, with A. E. Barit, left, Hudson president, and G. H. Pratt, right, vice president in charge of sales. Hudson recently revealed that its 6 and 8-cylinder engines are in reality high-compression designs capable of providing the compression ratios required to burn gasoline of 100 octane or higher

odd mile line across the Arabian peninsula, 62 per cent has now been licensed for export.

Spectrochemical Laboratories Inc. has been newly formed at 1010 Wood St., Wilkesburg, Pa., to offer complete spectrographic and wet chemical analysis service to producers of steel, aluminum, magnesium, bronze, ceramic materials and industrial chemicals. Eugene DuBois, former laboratory director of Orefraction Inc., Pittsburgh, is president.

Double A Products Co., Manchester, Mich., manufacturer of hydraulic oil control valves, has named Weinman Pump & Supply Co., Pittsburgh, as sales representative for western Pennsylvania and northern West Virginia.

War Assets Administration has transferred a forging plant in Melvindale, Mich., to Public Buildings Administration's national industrial reserve.

Brown-Wales Co., steel warehousing firm, is constructing a new plant and office on Rindge Ave. Extension, Cambridge, Mass., which should be completed this fall. Present company address is 493 C St., Boston.

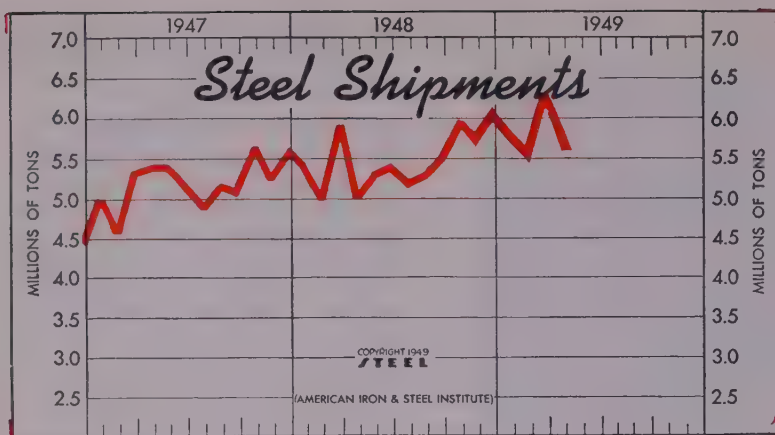
Aluminum Ladder Co., Worthington, Pa., has cut prices 5 per cent on most of its aluminum, industrial-type ladders. Reduction was made possible by completion of a retooling program.

Industrial Truck Division, Baker-Raulang Co., Cleveland, has appointed J. A. Webb Belting Co., Buffalo, as sales representative in western New York and northwestern Pennsylvania.

Pliobrico Jointless Firebrick Co., Chicago, has taken over the exclusive sale, engineering and installation of an over-fire air system manufactured by North American Mfg. Co. In the future the system will be sold as the PliOjet system for smoke abatement.

Navy Industrial Association, New York, has voted to change its name to National Security Industrial Association. The change was made to identify more accurately the association's activity in providing a liaison between all facets of industry and all branches of the National Military Establishment in the interest of national security.

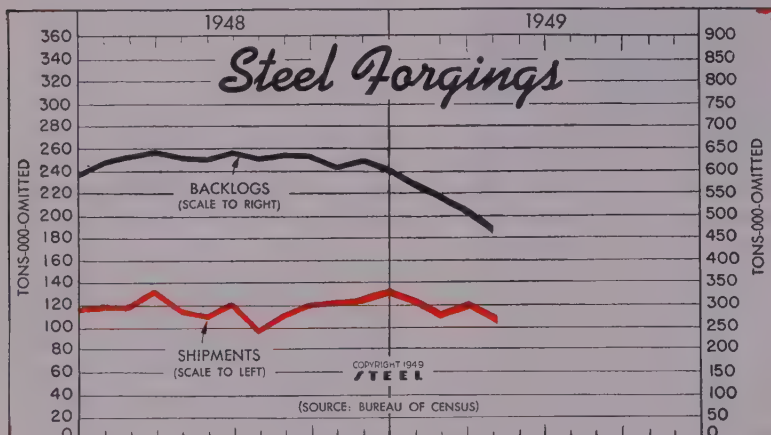
Norgren Co., Denver, manufacturer of pneumatic products, has purchased land in Englewood, a Denver suburb, and plans eventually to build a new plant.



Steel Shipments

(Net Tons)

	1949	1948	1947
Jan.	5,778,632	5,410,438	5,061,333
Feb.	5,519,938	5,046,115	4,626,424
Mar.	6,305,681	5,978,551	5,304,415
Apr.	5,596,786	5,096,161	5,445,993
May ....	...	5,321,375	5,442,343
June ....	...	5,476,774	5,263,711
July ....	...	5,229,880	4,974,566
Aug. ....	...	5,329,060	5,278,223
Sept. ....	...	5,511,474	5,118,839
Oct. ....	...	5,952,008	5,681,597
Nov. ....	...	5,732,256	5,216,990
Dec. ....	...	6,056,282	5,613,036

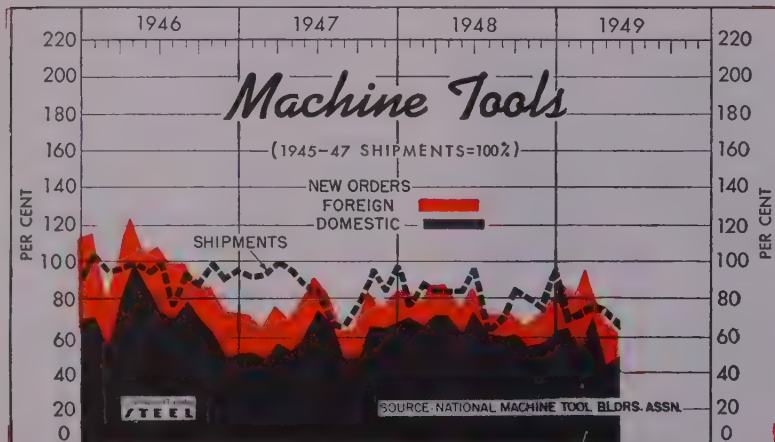


Steel Forgings

(Tons—000 omitted)

	Shipments*		Unfilled Orders*	
	1949	1948	1949	1948
January	125	118	571	618
February	111	117	540	631
March	120	131	504	641
April	104	114	465	628
May .....	...	109	...	624
June .....	...	120	...	641
July .....	...	97	...	627
August .....	...	111	...	634
September .....	...	121	...	631
October .....	...	123	...	605
November .....	...	124	...	621
December .....	...	132	...	601

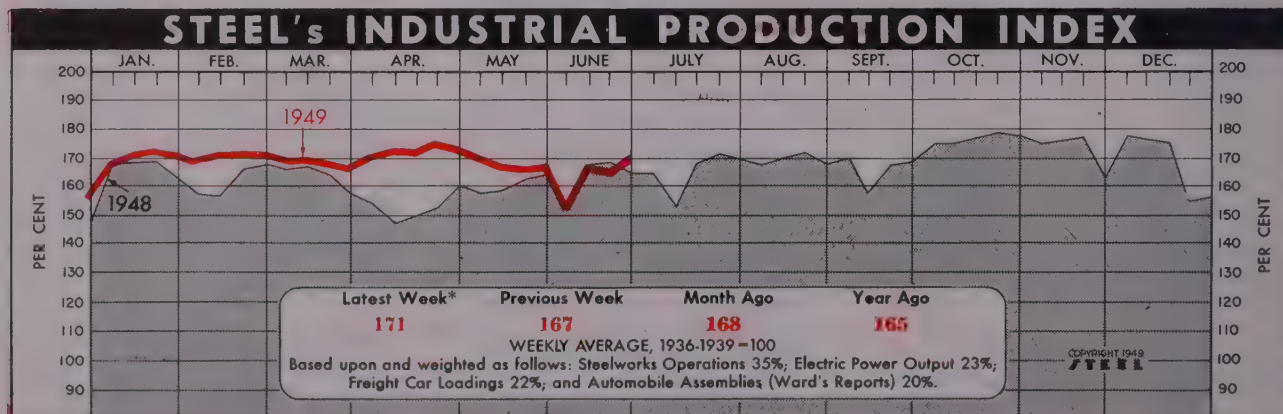
* Forgings for sale.



Machine Tools

(1945-47 Shipments = 100)

	Orders		Shipments	
	Total	Domestic	1949	1948
Jan.	87.0	83.1	65.1	69.1
Feb.	80.9	77.3	54.4	64.6
Mar.	93.5	86.3	71.2	70.2
Apr.	70.1	86.3	47.0	72.2
May	63.7	73.5	47.8	62.1
June ....	...	83.4	...	71.5
July ....	...	74.0	...	61.1
Aug. ....	...	73.7	...	60.9
Sept. ....	...	73.1	...	61.5
Oct. ....	...	67.4	...	53.4
Nov. ....	...	72.2	...	54.1
Dec. ....	...	76.7	...	60.5



* Week ended June 25 (preliminary).

The Business Trend

UNUSUALLY high level operations in the automotive industry in the week ended June 25 pushed STEEL's industrial production index up 4 points to a preliminary 171 per cent of the 1936-1939 average from 167 the preceding week. In recent weeks the index has been maintained at fairly high levels despite general falling off in most segments of industry largely on the strength of a continuing high demand for automobiles.

AUTOMOBILES—During the week ended June 25, for instance, the automotive industry's outturn amounted to 150,659 passenger cars and trucks, 4600 more than in the preceding week and the best weekly total since 1929. Also during the week the 3 millionth vehicle of 1949 rolled off an assembly line. June output is calculated at 628,300 units, July's yield is aimed still higher despite the fact that there will be one less working day and August assemblies are expected to set an all-time monthly record. A strike affecting one or more of the major builders could, however, kill any chance for reaching these goals.

STEEL—The ingot rate declined still further in the week ended June 25 to 84.5 per cent of capacity. This was the 14th consecutive drop in the weekly rate and brought it to a level which is 17 points below the postwar high reached in March.

CARLOADINGS—Freight carloadings, which went into a decline sooner than most other items in the economic picture, continue at a level well below 1948, which in turn was below 1947. Weekly loadings dur-

ing the first half of this year have averaged about 100,000 cars below those in the first half of 1948.

CONSTRUCTION—By the end of May, the dollar valuation of contracts awarded in the 37 states east of the Rocky Mountains by public agencies in 1949 was 19 per cent higher than in the corresponding period of 1949 but private contracts were down 20 per cent in the same period. Public work of all descriptions totaled almost \$1.4 billion while private work amounted to more than \$2.1 billion.

BUSINESS—Dun & Bradstreet Inc. reports that business failures in May declined to 776, down 12 per cent from the April total of 878 but still well above the postwar monthly average. Compared with the same month of last year, failures in May were up 82 per cent. Mining and manufacturing had 202 failures with a total liability of \$11.2 million. There were less casualties in all sizes of business concerns in May except in the \$25,000 to \$100,000 bracket where the total rose to 201 failures from 192 in the preceding month.

PRICES—The wholesale price index of the Bureau of Labor Statistics continued its downward movement in the week ended June 21 to 153.2 per cent of the 1926 average from 154.8 per cent in the preceding week. The bureau's comprehensive monthly wholesale price index declined 0.8 per cent in May to 155.7 per cent of the 1926 average, 5.2 per cent below the corresponding month in 1948 and 8.3 per cent lower than the postwar peak of August, 1948.

BAROMETERS of BUSINESS

INDUSTRY

Steel Ingot Output (per cent of capacity)†	84.5	86.5	94.5	96.0
Electric Power Distributed (million kilowatt hours)	5,466	5,373	5,270	5,257
Bituminous Coal Production (daily av.—1000 tons)	351	2,160	1,856	2,235
Petroleum Production (daily av.—1000 bbl)	4,889	4,868	4,897	5,494
Construction Volume (ENR—Unit \$1,000,000)	\$215.2	\$150.8	\$193.7	\$160.2
Automobile and Truck Output (Ward's—number units)	150,659	146,056	117,703	95,027

*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

TRADE

Freight Carloadings (unit—1000 cars)	737†	649	785	889
Business Failures (Dun & Bradstreet, number)	196	196	206	111
Money in Circulation (in millions of dollars)‡	\$27,345	\$27,391	\$27,367	\$27,792
Department Store Sales (changes from like wk. a yr. ago)‡	—8%	—5%	—5%	+21%

†Preliminary. ‡Federal Reserve Board.

FINANCE

Bank Clearings (Dun & Bradstreet—millions)	\$15,420	\$12,242	\$12,727	\$15,135
Federal Gross Debt (billions)	\$251.3	\$251.7	\$251.7	\$251.7
Bond Volume, NYSE (millions)	\$13.4	\$15.5	\$13.9	\$24.1
Stocks Sales, NYSE (thousands)	3,405	4,634	3,836	7,631
Loans and Investments (billions)†	\$62.6	\$61.9	\$62.2	\$63.1
United States Gov't. Obligations Held (millions)†	\$34,867	\$34,347	\$33,872	\$35,250

†Member banks, Federal Reserve System.

PRICES

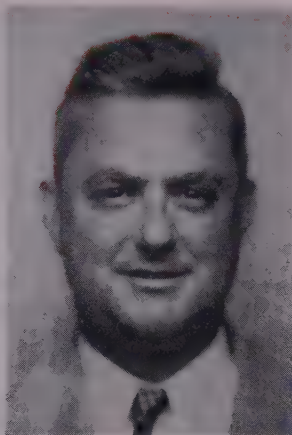
STEEL's Composite Finished Steel Price Average	\$91.82	\$91.82	\$92.77	\$80.27
STEEL's Nonferrous Metal Composite‡	164.6	166.0	176.1	200.9
All Commodities†	153.2	154.8	156.5	167.0
Metals and Metal Products†	165.6	166.1	167.5	157.9

†Bureau of Labor Statistics Index, 1926=100; ‡1936—1939=100.

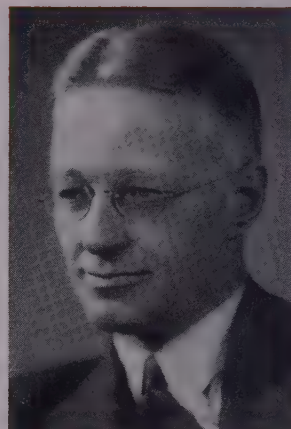
Men of Industry



STANLEY E. PETERSON



WALTER E. BEANEY



ARTHUR H. BUNKER

Whiton Machine Co., New London, Conn., announces promotion of **Stanley E. Peterson** to vice president and secretary, and **Walter E. Beaney** to vice president and factory manager.

—o—

Frank K. Metzger has been appointed general sales manager, Midvale Co., Nicetown, Philadelphia. He has been manager of railroad sales since 1946, and prior to that held executive positions with Baldwin Locomotive Works and its subsidiary, Standard Steel Works.

—o—

John A. Lauck has been appointed vice president, Pesco Products Division, Borg-Warner Corp., at Cleveland. He has been chief engineer of Pesco's Pump Division for the past four years. **D. A. Sutherland**, formerly Pesco's eastern sales manager for industrial products, has been appointed industrial relations manager. Mr. Sutherland will be succeeded by **G. V. Patrick**, formerly executive vice president, Cleveland Automatic Machine Co. **Frank R. Canney** was appointed sales engineer in charge of Pesco's sales activities with the airline company.

—o—

Sterling G. Maisch has been appointed production manager of Eaton Mfg. Co.'s Axle Division, Cleveland, to fill the vacancy caused by the death of **Charles H. Hunt**. Since joining Eaton in 1943, Mr. Maisch has been in the production department. He had previous association with the production office of West Steel Casting Co., Cleveland, and in the purchasing department of Standard Oil Co.

—o—

C. E. Weir has been appointed man-

ager of the Edwardsville, Ill., plant of United States Radiator Corp., Detroit. He succeeds **G. F. Naumann**, retired.

—o—

J. M. Davies, associate director of research at Caterpillar Tractor Co., Peoria, Ill., has been named director of research, succeeding **C. G. A. Rosen**, who is recuperating from a recent illness. Mr. Davies has been with the company since 1925. Mr. Rosen, in an advisory capacity, will devote his time to the further development of diesel engine design and performance, and will aid in the advancement of the company's technical program. Succeeding Mr. Davies will be **Dr. L. A. Blanc**, who has been assistant director of research, administering the activities of the Physical, Chemical & Metallurgical Division.

—o—

W. E. Bittner has been elected vice president-purchases, Diamond Alkali Co., Cleveland. He has been director of purchases for the past eight years. He will continue to make his home in Pittsburgh.

—o—

Frank R. Kohnstamm, senior vice president, Jack & Heintz Precision Industries Inc., Cleveland, has been elected president and chief executive officer, succeeding **Kenneth G. Donald**. Mr. Donald, who has been serving as president on a temporary basis, has been elected chairman. **O. T. Hess**, secretary, was elected vice president.

—o—

Nineteen Hundred Corp., St. Joseph, Mich., Whirlpool Division, has announced the promotion of **LeRoy W. Howard**, formerly regional sales manager, to sales promotion and advertis-

ing manager. Working under **Robert Mitchell** in the division, Mr. Howard will guide the promotion of Whirlpool machines. **Jack D. Sparks**, who has been in the sales department for the past year, has been appointed sales promotion and advertising manager, and in addition will be in charge of all export sales operations. Mr. Sparks has been with the company for 10 years.

—o—

Arthur H. Bunker has been elected president of Climax Molybdenum Co., New York, resigning his position with Lehman Bros. where he was a general partner, and where before the war he served as executive vice president. Mr. Bunker was the founder and first president of U. S. Vanadium Corp., and was also one of the founders of Potash Corp. of America. At present he is a director of American Metal Co. Ltd., Firth Sterling Steel & Carbide Corp. and Climax Molybdenum Co.

—o—

Elastic Stop Nut Corp. of America, Union, N. J., announces appointment of **Howard Peters** as project engineer for its Rollpin Division. Mr. Peters was formerly a vice president of Mid-Continent Metal Products Co., Chicago, and while with that company developed the process and machinery for producing the Rollpin fastener.

—o—

F. J. Healy has been elected president of the Canadian subsidiary of Sylvania Electric Products Inc., formed to manufacture fluorescent lamps and other lighting equipment. It will be known as Sylvania Electric (Canada) Ltd. **R. H. Bishop** has been elected vice president; **William O'Keefe**, secretary; and **M. F. Bal-**

Is UPKEEP COST your magnet problem?

Although it looks and lifts like new, this Ohio Magnet is actually 22 years old. Until recently, upkeep cost was zero. Then a ground developed in the terminal box and the magnet was shipped to our plant, where repairs were quickly completed without disassembly.

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OHIO PROTECTO-WELD MAGNET is welded *on top*, where weld cannot be dented in. Sizes include 39, 46, 55 and 65-inch diameters. Ohio also builds magnet control equipment.



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com, treasurer. Mr. O'Keefe, who is general foreman at the Danvers, Mass., plant of Sylvania, will manage the Canadian plant, while J. C. Hicks, formerly Kansas City, Mo., division manager, has been named sales manager, with offices in Montreal, Que.

Samuel F. Rolph has been appointed general manager of the Sager & Barrows Lock Works Divisions, North Chicago, Ill., for Yale & Towne Mfg. Co. He succeeds George J. Macklin, resigned. Mr. Rolph will also continue as general manager of Yale & Towne's Norton Door Closer Co. Division in Chicago. He is the inventor of various builders' hardware products.

Robert J. Howenstein has been promoted from machining engineer to assistant chief inspection engineer of Timken Roller Bearing Co.'s Steel & Tube Division, Canton, O. James C. Bryant was recently named chief inspection engineer of the division.

Farrel-Birmingham Co. Inc., Ansonia, Conn., announces appointment of Warren M. Pike as New England representative, with offices at Boston. He will handle the sale of gears and gear units manufactured at the company's Buffalo plant.

Jack Stout has been appointed district manager of the new West Coast office recently established by H. M. Harper Co. in the Thayer Bldg., Oakland, Calif. Mr. Stout has had training and wide experience in the manufacture and application of Harper nonferrous and stainless steel nut and bolt products.

G. R. Jones, who has been serving the Oldsmobile Division, General Motors Corp., in sales posts on the Pacific

Coast since 1933, has been made general sales manager, succeeding D. E. Ralston, who has been named executive assistant to the general manager. Mr. Ralston has been associated with General Motors since 1919, and since 1933 has been general sales manager for Oldsmobile.

Alexander H. d'Arcambal, vice president and consulting metallurgist of Pratt & Whitney, division of Niles-Bement-Pond Co., West Hartford, Conn., received the degree of metallurgical engineer, conferred upon him by his alma mater, the University of Michigan.

Adolph O. Schaefer, assistant to the executive vice president, Midvale Co., Philadelphia, has been appointed to the Research Committee of Franklin Institute, Philadelphia.

W. G. Twyman, production manager, A. P. Green Fire Brick Co. in Mexico, Mo., has been transferred to Detroit to become general manager of the A. P. Green Fire Brick Co. of Michigan, a subsidiary company. He is succeeded at Mexico by W. F. Mundy, who has been plant superintendent for the Green Company in Mexico since 1947.

Frank M. Goodman, formerly of Skil-saw Inc., has been appointed sales promotion manager, Industrial Division, Lincoln Engineering Co., St. Louis. He will work with the industrial distributors and promote the sale of Lincoln industrial lubricating equipment.

Thomas J. Williams has been appointed a sales engineer in the southwest for Edward Valves Inc., East Chicago, Ind., making his headquarters in Tulsa, Okla., with the Rockwell Mfg. Co. He was formerly em-

ployed by Pate Drilling Co. in Texas, and had previous experience with the Texas Co.

William H. McGunagle has been appointed sales representative in the northern part of Ohio, with headquarters in Cleveland, for National Foam System Inc., Philadelphia. He will handle the company's line of chemical and Aer-O-Foam fire protection equipment.

Harold H. Solof has been appointed general sales manager, Tracy Mfg. Co., Pittsburgh. He will head the sales organization, directing the national sales program for the company's customized kitchens, a complete line of steel kitchen cabinets. He formerly held the position of sales manager, National Accounts Division, for the company.

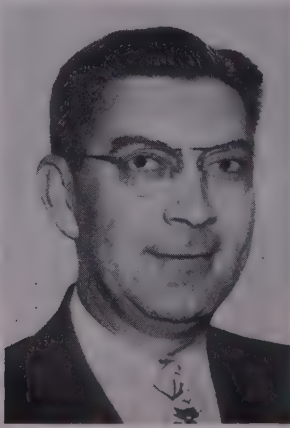
Leroy A. Johnson, for the past 12 years a member of the Research Division, Chicago Vitreous Enamel Product Co., Cicero, Ill., has been appointed a service engineer.

Hubert C. Smith, chief metallurgist of Great Lakes Steel Corp., Ecorse, Mich., has been appointed assistant vice president in charge of metallurgical control. A former chief metallurgist for Otis Steel Co., Cleveland, he transferred to Great Lakes in 1936, becoming chief metallurgist there in 1943. During the war he was loaned to the government as a special consultant to Army Ordnance, surveying captured enemy steel production facilities in Europe. The new post has been created at Great Lakes in recognition of the increased responsibilities for production quality which have accompanied the plant's expansion program.

Charles A. Burton, formerly assis-



JACK STOUT

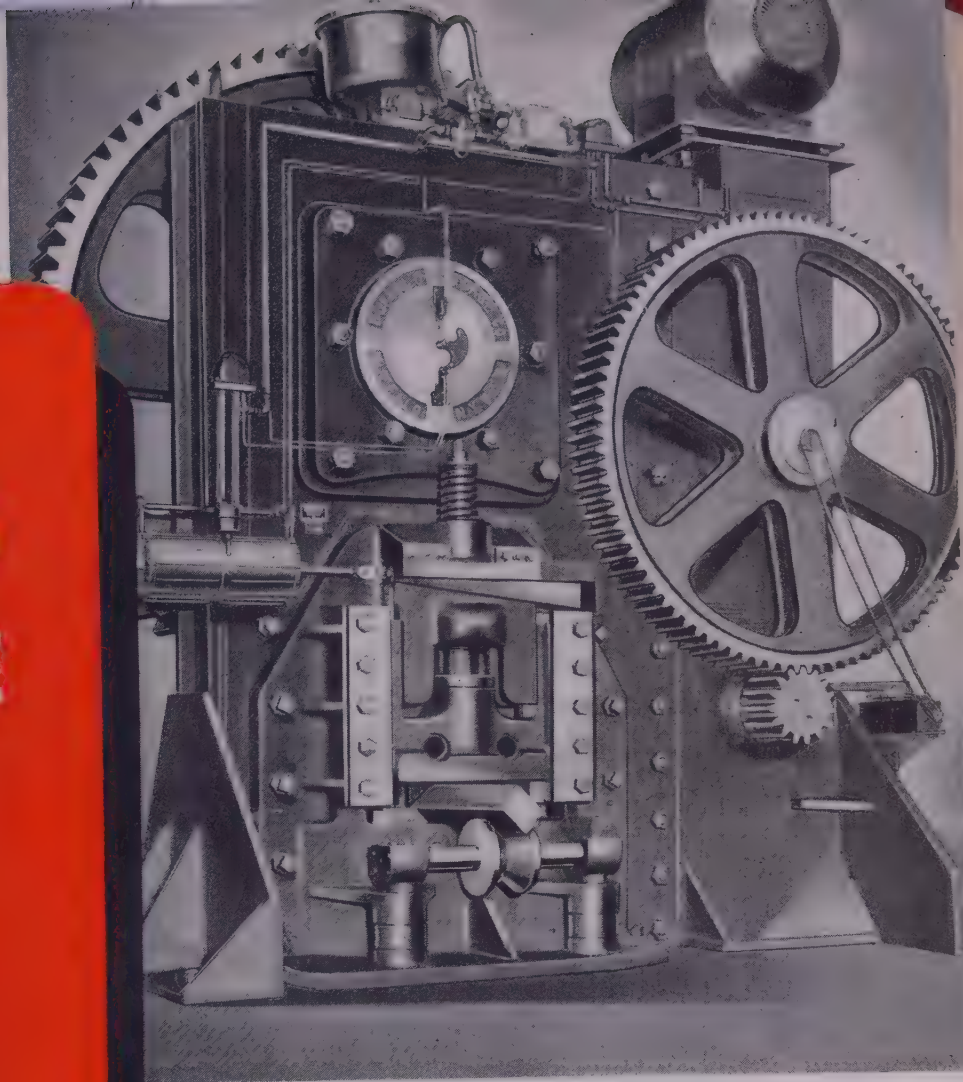


FRANK M. GOODMAN



HUBERT C. SMITH

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tant general sales manager, Lamp Division, Sylvania Electric Products Inc., New York, has been appointed product sales manager of the Lamp Division, and will make his headquarters at Salem, Mass. **A. L. B. Richardson**, formerly manager of the company's patent law department, has been appointed general attorney. **Louis H. Niemann**, formerly assistant purchasing agent for the Radio Division, Philco Corp., has joined the sales staff of Sylvania as a special sales representative for application development of subminiature and planar triode electron tubes.

—O—

Dudley J. Potter and **Ross E. Wayne** have been appointed to special sales posts for Simplicity Mfg. Co., Port Washington, Wis.

—O—

William E. Vollmer has been appointed to the chairmanship of the commerce and industry section, Drexel Expansion Program, Philadelphia. Mr. Vollmer, who is assistant vice president of SKF Industries Inc., has been co-chairman of the Metals Division of the Drexel program.

—O—

Two trustees elected to the board of Industrial Hygiene Foundation, Pittsburgh, are **H. K. Clark**, president, Carborundum Co., Niagara Falls, N. Y., representing the grinding wheel and abrasive industry, and **R. C. Taylor**, vice president, American Can Co., New York, representing the canning and allied fields.

—O—

Milford R. Waddell, industrial and public relations director for Black, Sivalls & Bryson Inc., Kansas City, Mo., has been elected a vice president of the National Industrial Advertisers Association, and also appointed membership chairman for the coming year.

—O—

Charles S. Conrad has been appointed director of steel sales, Tay-Holbrook Inc., San Francisco. He resigned as general manager of sales for Columbia Steel Co. to accept his new position.

—O—

William R. Kalbach has assumed new duties in sales and service engineering for Hagan Corp.'s Cincinnati district office. He has been in charge of service work in the corporation's New York district office since 1946.

—O—

Lloyd M. Cregor has been appointed regional sales manager for Crosley Motors Inc., with supervision over sales in California, Arizona and Nevada. He formerly was Western Division sales manager for Kaiser-Frazer



J. TEDFORD BACHMAN

Who has been appointed general manager of sales, Cold Metal Products Co., Youngstown. Noted in STEEL, June 20 issue, p. 90

Corp. Mr. Cregor will make his headquarters in Los Angeles.

—O—

Kenneth F. Brooks has been named plant engineer of Nash-Kelvinator Corp.'s plant at El Segundo, Calif. He previously served in various production and engineering assignments with Cadillac Motors, Ford Motor Co. and Chrysler Corp.

—O—

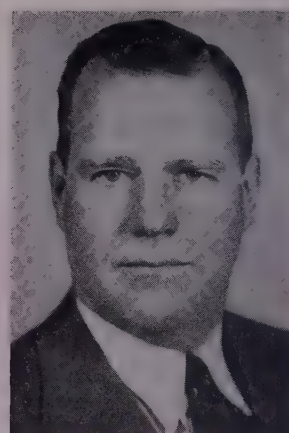
Willys-Overland Motors Inc., Toledo, O., announces the following appointments: **Robert M. Palmer**, truck and equipment sales manager, succeeding **A. T. Gardiner Jr.**, resigned; **C. Coyle Smith**, manager, project planning and research department; **Gordon A. Roth**, assistant treasurer of the company; and **Mark A. Howard**, business manager, sales department.

—O—

John F. Murray has been appointed general manager of the Balboa Pacific Corp., Fullerton, Calif. He has been chief plant engineer of the Daystrom Corp., Olean and Friendship, N. Y., another member of the ATF group.

—O—

General Electric Co., construction materials department, Bridgeport, Conn., has appointed the following district representatives: **Eugene D. Britt Jr.** will serve the Syracuse and Elmira, N. Y., wholesale trading areas, with headquarters in Syracuse; **Leo J. Halkovich** will serve the Johnstown and Altoona, Pa., area, with headquarters at Johnstown; **John F. Myles** has been appointed to the southeastern district, with headquarters at Jacksonville, Fla.; **Clinton J. Forstrom** has been assigned to the north central district with headquarters at Fargo, N. Dak.; and **Robert W. Johnson** will serve the area of New Haven, Waterbury and Hart-



ROGER W. BATCHELDER

Appointed vice president-sales, National Bearing Division, American Brake Shoe Co., New York. Noted in STEEL, June 27 issue, p. 50

ford, Conn., with headquarters in New Haven. **Allan W. Macker** has been appointed a building project specialist for the department, with headquarters at Boston, and **J. Donald Rooney** a district representative to the north central district, with headquarters at Minneapolis.

—O—

Col. William F. Long, who served as general manager, Associated Industries of Cleveland, for 25 years, has resigned his connection with that organization after nearly 30 years' association, during which time he retained his status as an army reserve officer, being attached to the War Planning Division of the office of the Secretary of War. In 1941 he was recalled to active service. Returning to Cleveland at the end of World War II, Colonel Long resigned his post as general manager of Associated Industries to become chairman of its advisory committee, at the same time being retained as its consultant in labor relations matters.

—O—

James F. Fairman, vice president, Consolidated Edison Co. of New York Inc., New York, has been elected president of American Institute of Electrical Engineers, New York, for the year beginning Aug. 1.

—O—

D. L. Markle Jr. has been appointed district sales manager in charge of the New Orleans office, Youngstown Sheet & Tube Co., Youngstown, succeeding the late **Orville B. Ewing**. He joined the company in 1938 as a salesman in the Dallas area, serving in that territory until being transferred to New Orleans in April of this year.

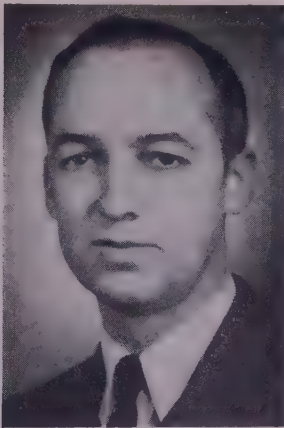
—O—

Henry V. Bootes, formerly assistant



TOMLINSON FORT

Appointed manager, apparatus sales department, Westinghouse Electric Corp., Pittsburgh. Noted in STEEL, June 27 issue, p. 52



WILLIAM W. SPROUL

Appointed sales manager, industrial products, Westinghouse Electric Co., Pittsburgh. Noted in STEEL, June 27 issue, p. 52



ROYAL C. BERGVALL

Appointed engineering manager, industrial products, Westinghouse Electric Co., Pittsburgh. Noted in STEEL, June 27 issue, p. 52

vice president, has been elected vice president in the sales department of American Car & Foundry Co., New York, continuing to make his headquarters at New York. Until joining ACF in 1947, Mr. Bootes was district manager of Ohio Injector Co. Since

1948 he has been assistant vice president in the sales department.

—o—

Herbert F. Weaver, manager of forgings sales for Bethlehem Steel Co., Bethlehem, Pa., since 1944, and an employee of the company in various

capacities since 1901, has retired.

—o—

H. D. Wright has been appointed director of sales, western region, Industrial Brownhoist Corp., Bay City, Mich. He will have headquarters at San Francisco.

OBITUARIES...

Harold C. Kinsey, 67, president, Cameron Machinery Co., Brooklyn, N. Y., died recently at his home in that city. He became president of Cameron in 1948, and had been a director of the company for many years.

—o—

K. H. Osborn, 63, vice president, Osborn Engineering Co., Cleveland, died June 25. He had been an officer of the company since 1916. Nationally known as a consulting engineer and a designer of stadiums, Mr. Osborn designed and his company supervised construction of the Yankee Stadium, Cleveland Stadium, and those at West Point, University of Michigan and Notre Dame.

—o—

Paul B. Seward, 54, president and general manager, Chase Steel & Supply Co., Los Angeles, died June 18.

—o—

Irving H. Jones, 67, associated with the railroad and steel business for more than 30 years, and in business for himself as a steel broker for the past few years, died June 17. He had former association with E. L. Esley Machine Tool Co., Joseph T. Ryerson & Son Inc., Central Alloy Steel Corp., Pittsburgh Crucible Steel Co., Molybdenum Corp of America, and Allegheny Ludlum Steel Corp.

—o—

George A. Caldwell, 85, one of the

founders of Mississippi Valley Structural Steel Co., Chicago, died recently. He was vice president and general superintendent of the Decatur Bridge Co. from the time of its organization in 1902 until 1922, when the name of the company was changed to the Mississippi Valley Structural Steel Co. He continued with the same official connection until 1935 when he retired from active participation, but remained as a director.

—o—

Levi T. Snow, 89, founder and chairman of the board, Snow-Nabstedt Gear Corp., Hamden, Conn., died in New Haven, Conn., June 21. He retired as president of the company in 1947, but remained chairman of the board.

—o—

Edward C. Greenstreet, eastern district manager for Chicago Vitreous Enamel Product Co., Cicero, Ill., died of a heart attack June 15.

—o—

Sidney G. deKay, 68, vice president and general counsel, Olin Industries Inc., New York, died June 22 at his summer home in Greenwich, Conn. He became vice president of Western Cartridge Co. in charge of the New York office in 1937, and when that company became a subsidiary of Olin Industries in 1944, became vice president and general counsel of the parent company.

—o—

Elias A. Cappelen Smith, 76, metal-

lurgical engineer and for many years a partner in the firm of Guggenheim Bros., New York, died recently. Mr. Smith was inventor of several scientific processes which contributed toward the commercial development of selenium, tellurium, platinum and palladium.

—o—

Frank A. Conrad, vice president, Puget Sound Sheet Metal Works, Seattle, with which he had been associated 36 years, died June 24.

—o—

William L. Poos, 59, for the past 26 years sales representative for Cleveland Graphite Bronze Co., Cleveland, 24 of them in the Detroit district office, died in Detroit June 16. He joined the Cleveland company practically at the time of its organization, and was widely known throughout the automotive engine field.

—o—

William B. Wait, 76, lawyer and president, Valve Pilot Corp., New York, died recently.

—o—

John R. Forbes, 75, president, John R. Forbes Foundry & Iron Works, Jersey City, N. J., died at his home in South Orange, N. J., June 22.

—o—

Otto Zielsdorf, 78, chairman of the board, C. Hennecke Co., Milwaukee, died June 22. He had been president of the firm 57 years until he became board chairman several years ago.

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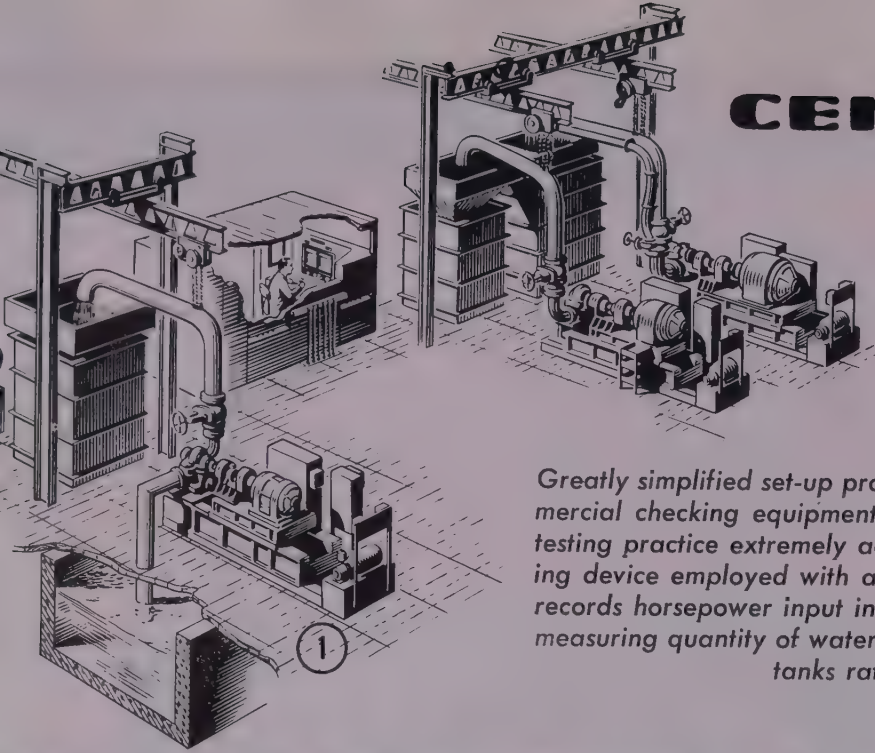
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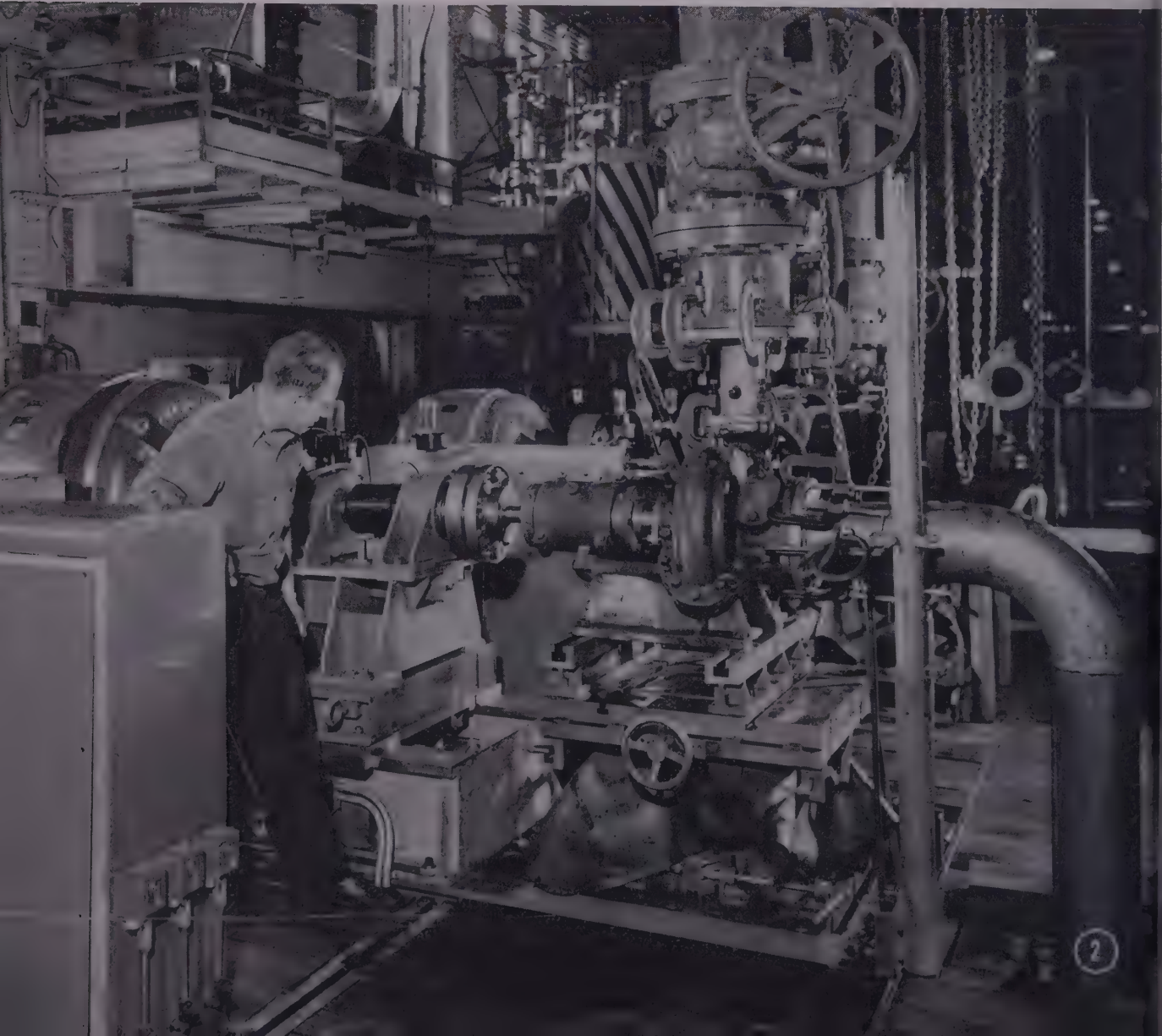
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CENTRIFUGAL

PUMPS



Greatly simplified set-up procedure coupled with efficient commercial checking equipment makes Allis-Chalmers' new pump testing practice extremely accurate and fast. A speed measuring device employed with an electric strain-type torque meter records horsepower input into the pump. New equipment for measuring quantity of water pumped involves the use of weigh tanks rather than weirs



TESTING FACILITIES

... save time and labor

HOW mass testing of volume-produced industrial equipment can benefit from effective application of latest engineering developments is convincingly demonstrated on the new pump test floor at Allis-Chalmers Mfg. Co.'s West Allis, Wis., works. Volume of water flow is measured by weight, utilizing a specially-developed electronic timing device. Remarkable accuracy comes from such innovations as the application of torque meters for power measurement in pump testing, and an electronic device capable of measuring motor speed accurately to within 1 rpm.

Extent to which the possibility of human error has been removed can be judged from the fact that torque, speed, pressure and vacuum are all read on automatic recording instruments. Except for adjusting the discharge valve, an operator can control all phases of the pump testing from a master control panel.

It is obviously desirable to determine whether or not a pump lives up to its performance guarantees before it is shipped and installed. Though it may not be generally realized, it is also important to make sure that a pump does not materially exceed its rated

performance. Since selection of a driving motor is made on the basis of designed pump performance, if a pump were to deliver more water than expected under given conditions of speed and head, the motor would probably be overloaded. Also, if the pump is to be part of a system where flows and pressures have been carefully calculated, it would be troublesome to have a pump discharge either more or less liquid than the amount specifically figured for it.

Test Stands—The new testing facilities have three permanent test stands equipped to handle pumps with different horsepower and speed requirements. These were selected after a study of Allis-Chalmers' pump production indicated that most of the units being built could be tested on these three stands. Each station has a test stand for mounting the pump and small discharge pipe suspended overhead, means for connection to meters and gages in the control room, a hydraulic pump and motor, and a hydraulic control panel.

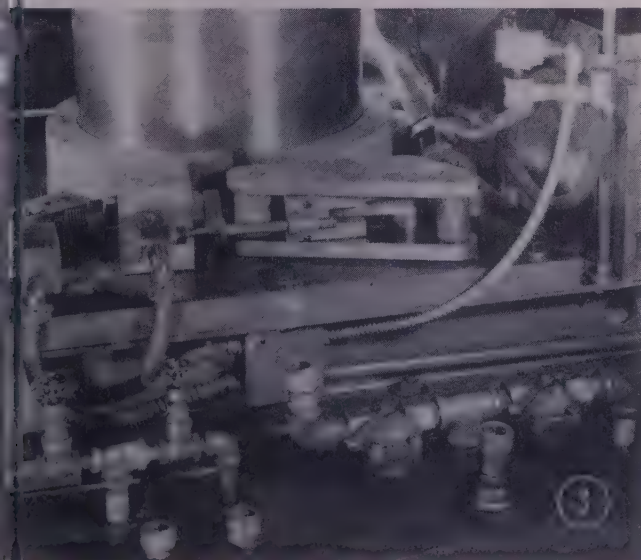
The test stand at each station consists of movable supports for the motor and for the test pump. The pump test table is mounted on a hydraulic cylinder,

Fig. 1—Sketch of centrifugal pump test floor

Fig. 2—Pump being tested. Operator, having lined up pump and motor, has just operated hydraulic control to slide motor forward so couplings will join

Fig. 3—Lower part of pump pedestal, showing hydraulic cylinder, brake, limit switches and pressure gage couplings

Fig. 4—Interior of control room



and can be raised and lowered by means of a control lever on the hydraulic control panel. The cylinder's diameter is large, to give rigidity. It can be clamped tightly in position by means of a hydraulically-operated brake. The test table has T-slots to which the pumps can be bolted. This table can be slid sidewise or turned slightly in the horizontal plane, if necessary, by means of a handwheel and hand lever.

Motor, torque pickup, frequency generator unit and motor half of the coupling to the pump are all mounted as a unit on a sliding base, which can be moved toward or away from the pump test table by hydraulic power, controlled by another lever on the control panel. Connections to the speed and torque elements in the control room plug into the pickups from junction boxes located on the side of the fixed base. Power connections to the motors on the test stands are permanent, except in the case of the largest test stand. Since large pumps may be designed to operate at any of several speeds, provision is made on this stand to exchange motors quickly when desired.

Electrical power connections to the motor are made in a junction box on the side of the motor, and are designed for quick connection and disconnection. The alternate motor for this stand is complete on its slide with its own coupling torque meter and generator

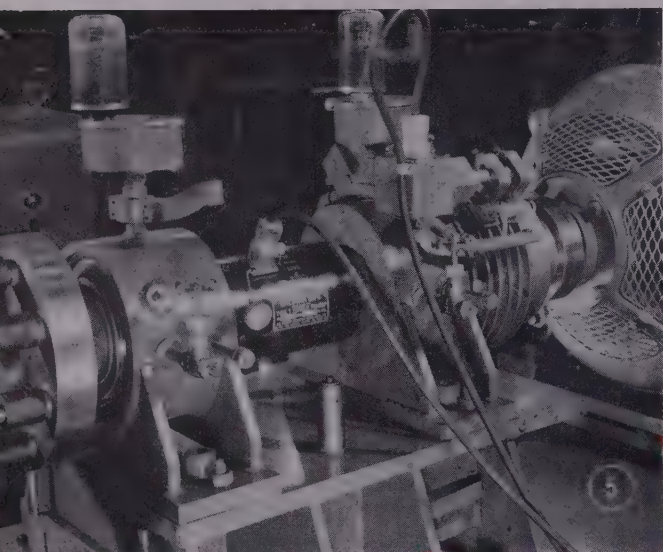
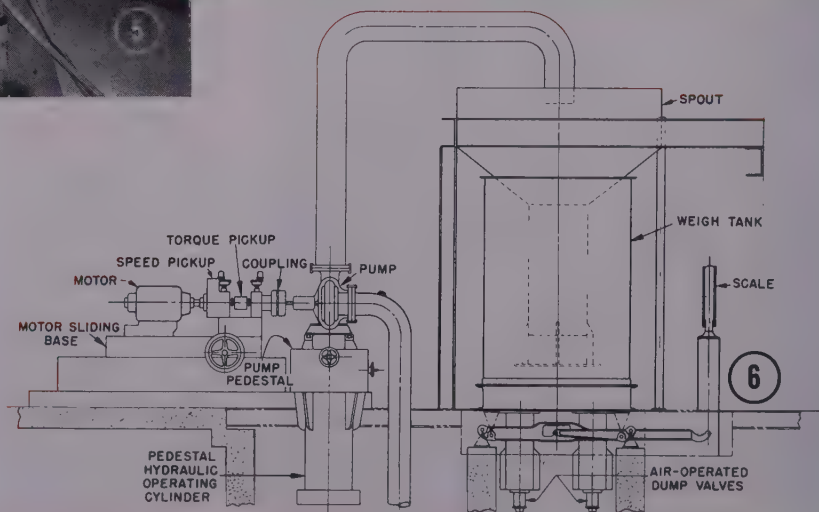


Fig. 5—Closeup of type of couplings used, torque pick-up and speed generator on the 50 hp test stand. Housing of generator is removed to show the five rings

Fig. 6 — Outline drawing showing complete test stand, including pump, motor, weigh tank and scale



unit. Consequently, when exchanging motors, one complete slide is lifted off the ways on the fixed base and replaced with the other.

Operation of the Control Circuit—The scales used represent a new application worked out by Allis-Chalmers and Toledo Scale Co. Automatic actuation of the test control circuits is accomplished through utilization of the motion of the scale weight indication mechanism, as weight is added to the scale.

To visualize how the system works, assume that 450 gallons of water are required in the tank to bring the scale to equilibrium, and that we desired to use 1000 gallons as the amount of water to be pumped during the test. Two photoelectric cells are mounted on the scale dial, one at a weight corresponding to the weight of 450 gallons of water and the other at the weight of 1450 gallons of water. There, the pointer moving around the dial of the scale interrupts a beam of light to these cells, actuating the control circuits to start and stop the tests.

Actually, it is desirable to have more than one possible test weight to choose from. With the above arrangement, if a pump of 500 gpm capacity were being tested, a test run would occupy 2 minutes, which is unnecessarily long. If a pump of 6000 gpm capacity were being tested, the test period would be 10 seconds, which is too short for optimum accuracy. It would be better to have photoelectric cells capable of stopping the test located at several weights around the dial, with some means to select the one which will operate the control circuits to stop the test.

To eliminate the need for the complicated wiring which would be required if one scale pointer and several photoelectric cells were to be used for control, the actual scales used on the test floor have only one photoelectric cell, and several pointers. The pointers have enlarged tips to make sure that as they travel past the cell, they interrupt the beam of light for a long enough period to insure action in the cell circuit, and are thus referred to as "paddles."

The photoelectric cell is (Please turn to Page 100)

DIRECT ACTION ON EXPORTS: Ever since the end of the war, everyone in the American machine tool business has been excited about business possibilities in Latin America. Various expedients have been tried—usually through the medium of entrepreneurs—to develop this potential Latin American business.

Great things have been promised, but as far as I can make out from my conversations with machine tool friends, the principal deliveries have been made by European competitors who supposedly were completely “busted-and-down-and-out” as a result of the war. It is amazing what miracles have been accomplished in what seems to many of us to be the wrong places, by transfusions of Marshall plan money.

Be that as it may, a group made up of 11 leading American machine tool builders now has decided to try the good old Yankee method of direct approach on this Latin American marketing problem. Eventually, the activities of this group may involve barter and exchange—which seems to be one of the secrets of success of many of the European groups now operating in South America. For the time being, however, activities of the newly organized Amertool Services Inc., will be confined to “installment selling” similar to that long practiced successfully by machine tool builders here in the United States.

To get a solid foundation under these Latin American installment sales, the officers of Amertool are concluding an agreement with the Export-Import Bank for a revolving credit to finance up to \$3,000,000 of orders for this group of companies. This credit will enable industry in Latin America to place orders for equipment from member companies and to pay over a period of 18 months.

In effect, beneficiary firms in Latin America will have the use of modern American machine tools—“the World’s Best Investment”—while they are paying for them out of earnings of the machines themselves. To make sure that they produce those earnings, Amertool will give its customers the benefit of the best American engineering and production “know-how.” This all seems to make sense.

BIG HOUSE ON THE HILL: For the duration of the co-operative show held by the Vermont machine tool builders during the week of June 20, I was a paying guest in a fabulous 40-room mansion atop Juniper Hill overlooking the village of Windsor in the shadow of Mount Ascutney. To me this was an experience which aroused memories and emphasized the economic and social changes which have swept over our country in my time.

As a small boy nearly 50 years ago, I watched the blasting of ledges and the building of roads and the straining of four-horse teams and the laying up of great chimneys and walls of this “Big House on the Hill” which was to be the home of Maxwell Evarts. Maxwell Evarts (1862-1913), rockribbed Republican industrialist, big-time New York lawyer and business associate of E. H. Harriman, was the moving spirit, major stockholder and president of the Windsor Machine Co. This company started in 1888 by a group of workmen with \$6000 worth of second-hand

SEEN AND HEARD IN THE

Machinery Field

By GUY HUBBARD

Machine Tool Editor

machinery, was sold to National Acme in 1915 for \$3,575.00.

Maxwell Evarts entertained many important people in his big house on the hill. I recall seeing Theodore Roosevelt, President of the United States, flashing his toothy smile from the Evarts’ carriage as it rolled through the main street of Windsor on its way to the Juniper Hill estate.

Some ten years later, on a less happy occasion, I also recall seeing Theodore Roosevelt, “Bull Moose” candidate for the presidency, lambasting Maxwell Evarts as an “economic royalist” as he addressed several hundred workmen of the Windsor Machine Co. from the rear platform of his campaign train. Spotting his one time friend in the throng, the man who split the Republican party shouted: “This man Evarts is keeping you men as wage slaves so that he can live in that big house on the hill!”

That rotten apple thrown by “T. R.” didn’t land in the barrel for the simple reason that every man in the audience from Frank L. Cone and George O. Gridley down to the casting snaggers and sweepers knew and respected Maxwell Evarts. They realized that his own capabilities had put him in the big house on the hill. They also realized that there were more and better jobs in Windsor because through his enthusiasm and financial and business connections—and his ability to select and develop capable lieutenants—a country machine shop had grown to be one of the great machine tool plants.

Maxwell Evarts lived before the days of public relations counselors, but to my way of thinking he managed to do an effective job along that line by the simple expedient of keeping up personal and sympathetic contacts “down among the grass roots.”

If Maxwell Evarts could return to the land of the living, he certainly would be pleased to find that machine tool building in Windsor has been perpetuated in Windsor through engineering and business activities of his lieutenant, the late Frank L. Cone. Also, he would be pleased to find that through the engineering ability and determination of Catherine Cushman, who now owns and operates the big house on the hill, the jinx of Mount Ascutney finally has been licked. Where strong men with oxen and heavy draft horses failed in quarrying and lumbering operations, this little woman with bulldozers, jeeps and snow-cats has succeeded in slashing out a wonderful ski run on Ascutney’s rugged slopes. Mr. Evarts always surrounded himself with people who got things done.

Fig. 1—Positioning sheet for trimming

Fig. 2—When first cut is made crosswise, as shown here, the same procedure is followed as in the previous sequence



Fig. 3—In this shear sequence, four lengthwise cuts are required to slit the sheet



IN SOME sheet metal fabricating shops it is not unusual to find stacks of metal scattered over all available floor space with each gage and size represented by two, three or more stacks in as many places.

Aggravating this condition is the practice of planning and engineering departments of buying special sizes of sheet for a given job in order to minimize shear loss. Such a purchasing policy may have applications and be economical where mill purchases of thousands of an odd size are involved. For the vast variety of job shops where a few score or less pieces of a size are required the problem of stocking, handling and disposing of extra sheets left over or procuring sheet short on a given run can be extremely complicated.

It is admittedly difficult to get the front office, the planners and the purchasing organization to see all the intangibles of housekeeping, scheduling, lost or misplaced stock which arise when special sizes are ordered for specific jobs, as a regular control procedure or to get adequate floor space to store the large variety of sizes involved.

Sheets Standardized—Recognizing the seriousness of the problem and the losses arising from the material handling involved under the old system, an en-

tirely new method was developed. Moderately large sheets were made standard, namely, 60 x 120 in 20 gage through 3/16-inch. They were purchased in 5-ton (5-inch thick) packs, banded and put on 2 x 4-inch skids.

Two large plate hooks were bent up from a triangular shaped plate $\frac{1}{2}$ x 36 x 36 inches which has a large eye at the top of the triangle to take the regular crane chain hooks. Stack bins shown in Fig. 4 were designed and built. The available stock space is 6½ inches high. A whole new pad or bundle may be

hearing

By WILLIAM MADDOX
Foundry Plant Engineer
Cincinnati Milling Machine Co.
Cincinnati

... facilitated by efficient handling practice

placed on top of the remaining stock. Less active gages are placed in the lower bins.

Procedure for refilling racks is simple. Plate hooks are used to lift the empty racks from the stack down to the lowest one requiring new stock. The 5-ton pack or bundle is placed on the rack, still using the plate hooks. The next rack is stacked on the lower racks and a bundle is placed on it, etc. It will be noted that the rack is located under a crane, whereas the shear and subsequent sheet metal processing can be done in a low bay or area not serviced by overhead crane, if the work is limited to light gage.

Design of Stack Bins—Design of the stack bin racks may be of interest. They are 12-gage steel and skin stress design. When the maximum of $6\frac{1}{2}$ tons of sheet is in the rack the platform does not sag noticeably. With such a lightly constructed rack, plate hooks should not be used to lift several bins or racks all partly loaded at one lift, as the concentrated stress on the edge of the platform will overload the edges and bend them. The edges are not intended to support 10, 15, or 20 tons. Making single lifts is no real burden, as the entire rack can be disassembled, loaded, and reassembled in about $\frac{1}{2}$ -hour as compared with many hours required when the sheets are put into the racks, sheet by sheet by two men by hand.

Much of the sheet used today is pickled and oiled. This oil causes the sheets to stick together. In the heavier gages especially, their removal from the rack constitutes a real problem and heavy physical labor. A solution to this problem has been worked out and has been in steady use for years. Top sheet is separated from the rack with a sharp tool such as a pinch bar or screw driver. Next a toggle lock pair of pliers is clamped to the sheet at the same time the pinch bar is pulled from between the sheets. A small air nozzle which is connected through a hose to a shop air line of 60 to 90 pounds is inserted. When the air is turned on the air jet spreads out separating the sheet from those underneath and floats it free. By pulling on the sheet which is floating, letting the hose nozzle fall free and cut off, the shear operator can slide the sheet out on the ball transfer posts before it sticks to the pile again. No heavy straining or pulling is involved and one man handles the sheet.

Positioning Sheet—As shown in Fig. 1 the sheet is then properly positioned to be trimmed square with the end. A precision power-driven back gage, complete with vernier indicator controlled by pushbuttons from the front is absolutely necessary for effi-

cient shear operation. Time lost going to the rear of the shear to adjust the back gage for each width to be sheared is prohibitive if efficient operations are desired.

Placing the shear so that the first cut is normally made this way is rather unusual, yet it can be demonstrated that there are good economical reasons for doing so. Assume that 18 pieces 19 x 19-inch sheet are required and that the first cut in both cases will be a trim cut to square the sheet. In shear sequence No. 1 (Fig. 3) four lengthwise cuts are required to slit the sheet, the fourth or trim cut being necessary in order to cut to width. As each 19-inch strip is then returned to the front of the shear the one end is square so that an initial trim is not necessary. Cuts 5 through 9 are made and the sheet reversed so that trim cut 10 can be made.

Repeating the procedure for the other two strips, 18 pieces are then produced by 22 cuts. But when the first cut is made crosswise as in Fig. 2 and the same procedure is followed as before, 26 cuts are required to produce the same number of parts (18). The second cutting sequence then requires 18 per cent more shear strokes in the cutting of these particular pieces. The larger the number of parts produced, the more the spread and vice versa and in some cases there is no difference in the number of cuts required whichever sequence is used.

The offal from the shear slides down over an apron and lands on bars placed on the floor at 90 degrees to the shear. Cables with loops laid on the floor alongside the bars permit picking all long trim scrap up from the floor with the crane. When activity justifies a second shear, one will be installed at 90 degrees to the first so that the final cut may be made without returning the strip to the front of the shear. At the same time the first shear will be raised 3 feet in the air so that the stock can be moved directly to the second shear table.

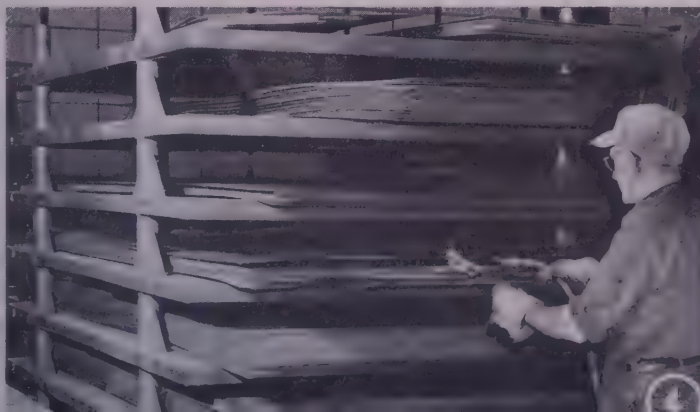


Fig. 4—Separating and removing sheet from the stack bin

● SIMPLIFIED Lubrication PLAN FOR

By J. C. VAN GUNDY
Technical and Research Division
The Texas Co.
New York

Herein is presented a means for maintaining quality lubrication, yet reducing costs of maintenance and total number of lubricants used in a given production shop to a minimum

MACHINE tools of today are capable of turning out finished products at speeds and accuracies that are astounding. To do this, however, it is necessary that all parts of a given machine tool function properly. A very important factor contributing to satisfactory performance is effective lubrication. Without this, accuracy may be lost, oils may overheat causing temporary misalignment of machine parts, or metal to metal contact may occur causing rapid wear or complete seizure between moving parts.

Important too is the length of time the lubricant "stays put" in the machine. Most lubricants today—both greases and oils—are manufactured to withstand oxidation and other deteriorating factors for much longer periods than was possible only a few years ago.

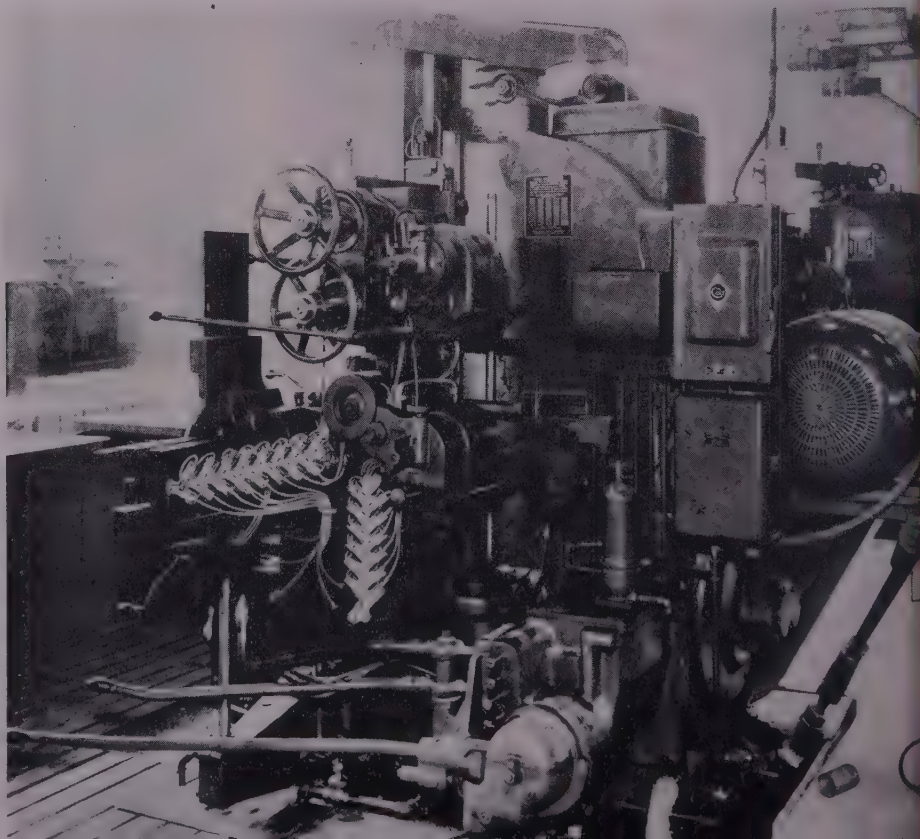
Another important factor in machine tool lubrication is economy. How can the best economy in lubrication and maintenance of machine tools be obtained? —By intelligent lubrication, namely: Use of the right

product for each requirement; applying quality lubricants designed to prevent wear and the formation of gum, sludge, rust or foam, any of which, if permitted to develop, can cause excessive maintenance bills; and making use of a simplified lubrication plan to reduce inventories and minimize the possibility of costly errors due to a mix-up in products used.

Importance of Effective Lubrication—Effective lubrication of machine tools means much more than the use of the correct grade of lubricant at the right place in sufficient quantity adequately to lubricate moving surfaces. It includes also the use of products which will function over long periods without appreciable changes in their physical or chemical characteristics, use of efficient filters where necessary to keep out contaminants, application of the minimum amount of lubricant necessary to prevent wastage and other similar factors. Only when all such conditions are taken into consideration can lubrication be as-

Fig. 1—Portion of a grease dispensing system on a Bullard vertical turret lathe. Photo courtesy Alemite Division, Stewart-Warner Corp.

Fig. 2 — Automatic lubrication system for oiling this five spindle automatic bar machine produced by Warner & Swasey Co. Photo courtesy Bijur Lubricating Corp.



MACHINE TOOLS

sured which will result in continuous trouble-free operation at a minimum cost.

The present era has focussed much more attention on lubrication than ever before. Primarily, this is due to two factors: Rising cost of maintenance which favors automatic and positive means of relubrication, and development of precision machines capable of much higher rates of production.

The latter, particularly, has been responsible for increased attention being given to more careful selection of lubricants.

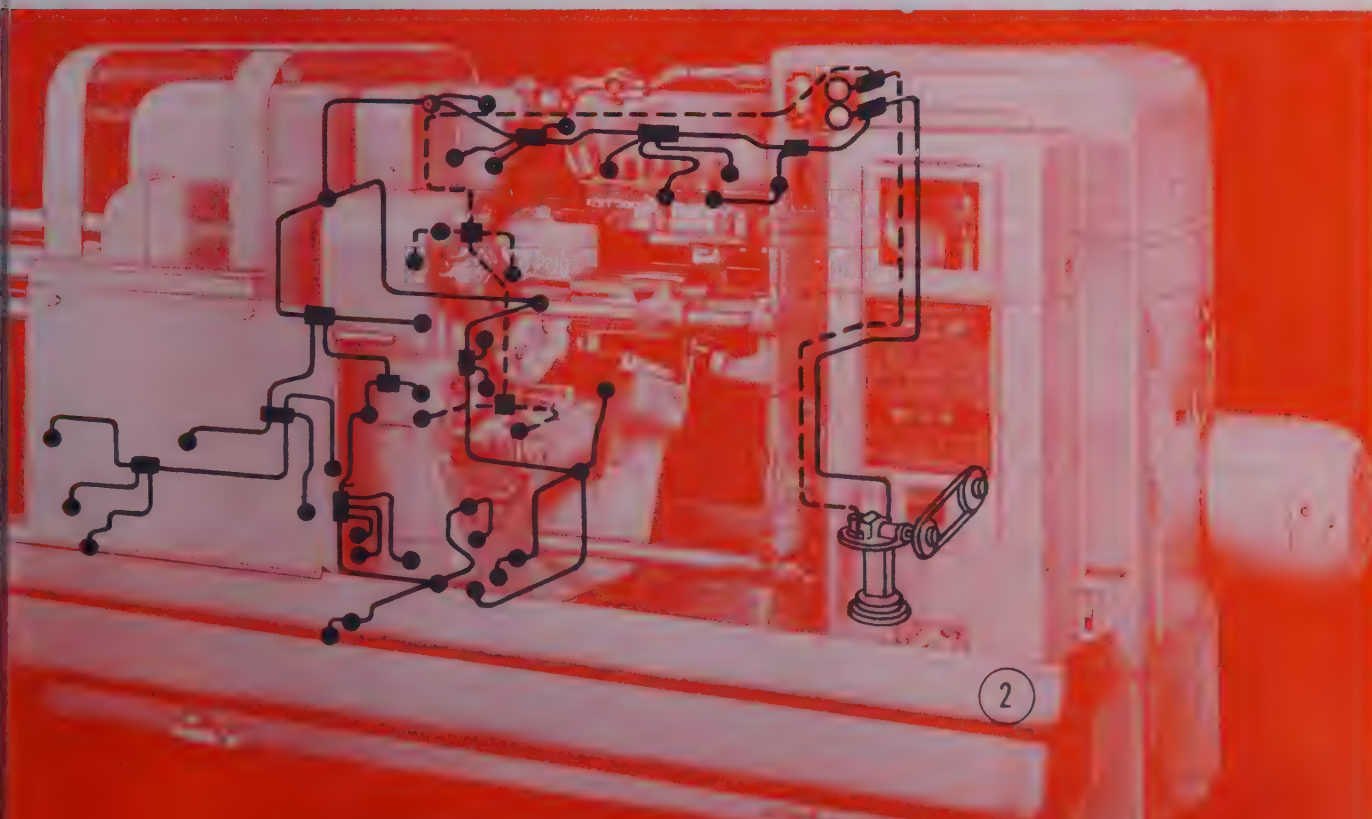
It is unnecessary for machine tool operators to determine the grade of product to be used for each bearing or gear in all the machine tools he operates. This responsibility, and rightfully so, lies with the machine tool manufacturer and lubricant supplier. In years gone by, many machine tool manufacturers made no lubricant recommendations at all, or at least, only very meager ones. Even though this condition still exists today with some manufacturers, the majority issue lubrication instructions giving explicit advice as to proper lubrication of their machines. Such instructions are prepared as a result of tests made by the manufacturer, usually in co-operation with lubrication engineers from one or more producers of petroleum products.

Regardless of the diversity of such manufacturers' recommendations, in any production plant containing numerous machine tools it is necessary and economical to reduce the total number of lubricants used to an absolute minimum. Many plants employ a lubrication engineer, and if so, this is his responsibility. In the majority of production shops, however, no employed lubrication engineer is available and in such cases consolidation is sponsored by the oil supplier.

One factor which has made possible the consolidated or simplified plan presented herewith is the tremendous advancement made in the quality of petroleum products during the last decade. As a result of improvements made in greases, for example, only one grease is normally employed now to meet all grease requirements in a specific production shop. For this reason, as a required prerequisite to any simplified plan, it is necessary that types of products available today be clearly known.

Quality of Lubricants—Modern machine tools equipped with antifriction bearings and precision gears operating with close tolerances and at high speeds, are in the majority of cases equipped with splash, bath, or centralized lubricating systems. Such systems require the use of the highest quality lubricants. Experience has shown that the use of "quality" products reduces maintenance costs, and improves machine performance.

Oils used in reservoirs should be so refined that they are highly resistant to oxidation—otherwise gum or sludge may be formed, resulting in unnecessary down time to clean out the machine. In addition it is highly desirable that their properties be further fortified by the incorporation of additives. Depending upon the type of oils used and the properties needed, various present day oils contain additives to improve oxidation resistance, to prevent rust formation, to



overcome foaming due to entrained air and to increase extreme pressure, oiliness, or adhesive qualities.

Acceptance of the use of additives in petroleum lubricants is shown by the fact that in the last 15 years the additive manufacturing industry has grown until now approximately 1500 barrels of additives are produced per day with an annual value of \$35 million. The many benefits to be derived by use of additives in lubricants will be discussed in detail under various ensuing sections.

Cheaper or second grade oils are still used on some machine tools, particularly machines which are rather old. Such oils are satisfactory for "once through" lubrication points such as oil cups, oil holes, wick feed and similar oiling methods where the oil makes a single pass through the bearing. Even with older machines predominantly lubricated by oil cups, however, it is often desirable to use quality lubricants. Such machines are usually in a minority in any given shop and stocking of two oils of the same viscosity, one a high grade for reservoirs and the other a cheaper grade for oil cups, proves more expensive in the long run.

Correct Viscosity Important—Importance of using the correct viscosity or grade of oil cannot be overstressed in the lubrication of modern precision machine tools. In older machines, or in tools which do not produce work to close tolerances, viscosity is less important and oils with a rather wide range of viscosities may be used with entire satisfaction.

On close fitting parts used so prevalently in modern tools viscosity should be kept within the limits specified by the manufacturer. Obviously, it should not be so low that metal to metal contact might occur. Use of an oil having too high a viscosity also has several disadvantages. Internal friction developed in the oil can cause it to overheat, resulting in more rapid oil deterioration and heating up of the metal parts surrounding the oil. The latter is particularly troublesome on machines working to very close tolerances for the excessive heat generated may be sufficient to expand the frame of the machine or parts thereof to such an extent that the cutting tools or work must be reset periodically.

Simplified Lubrication Plan—Simplification and economy are intimately related insofar as lubrication of machine tools is concerned.

Progressive machine tool operators are constantly endeavoring to reduce the total number of lubricants required for the proper lubrication of their machines. This has been influenced in recent years by several factors, including the increasing cost of maintenance, the necessity of reducing overhead expenses and primarily, the availability of newer types of lubricants which are capable of functioning under wide varieties of conditions.

Fig. 3—Automatic lubrication for gear train and spindle in a No. 33 Rigidmill. The oil pump actuated by an eccentric on the lower shaft delivers oil to the header from which it is delivered to individual bearings by tubing as indicated. Note flow gage through which visual observation will show that the distribution system is functioning properly. Sketch courtesy Sundstrand Machine Tool Co.

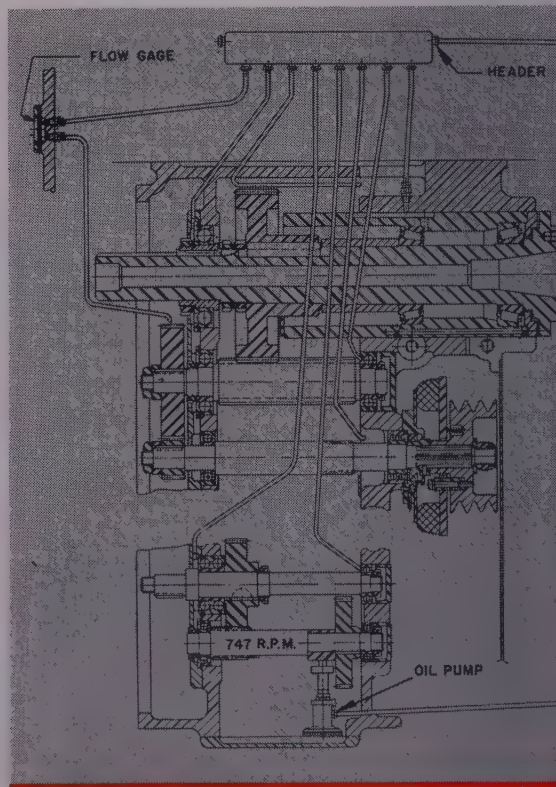
The primary purpose of this article is to present a simplified lubrication plan for machine tools. This plan takes into account all of the above factors. Briefly, it presents a method for consolidating the number of lubricants used in a given production shop to an absolute minimum. Specifically, the products recommended in this plan are shown in Table I.

This consolidated or simplified list of lubricants for large production shops, was developed as a result of a study of all machine tool manufacturers lubricant recommendations and extensive field experience obtained with the types of products recommended. This list will apply to the great majority of machine tools in use today. (In a few instances, however, specialty products may be required.) Even all the products listed may not be necessary in a given production shop; for example, use of two greases, two hydraulic oils or several way lubricants and spindle oils may be unnecessary.

In order that the recommendations may be understood more clearly each is discussed in detail in the following sections.

Hydraulic Systems—Probably nowhere on a machine tool can trouble occur as often as in the hydraulic system if accepted maintenance procedures are not followed. These include the use of the correct grade of oil with a quality commensurate to demands placed on the oil by the hydraulic system.

Many factors contribute to the need of special care in selecting hydraulic oils. Conditions which cause oils to oxidize present one of the foremost. These conditions include operating temperatures ranging up to 150° F or even higher in a few instances, severe agitation at each pass through pumps and valves, pressure, presence of metallic catalysts and unfor-



nately in some instances various contaminants such as cutting oils. As a result inhibitors are now incorporated in hydraulic oils to retard oxidation; their effectiveness being phenomenal. Field experience has shown that intervals between drain periods may be increased many times over that obtained with straight mineral oils, and more important the possibility of gum or sludge formation in the system is almost entirely eliminated.

Rust formation in hydraulic systems is another factor contributing to poor hydraulic system performance. Rust can be caused by condensation of moisture in the reservoir, contamination such as from coolants, or leaking water coolers. Fortunately, rust formation can be prevented by the addition of small amounts of inhibitors to the oil. These inhibitors "plate out" on metal surfaces, forming a film which is impervious to the rusting action of moisture and air.

A third factor is foaming, which is troublesome in some systems. Here again, it is possible to so treat the process the oil that any entrained air in the oil is quickly separated. Presence of air in hydraulic oils can result in erratic motion of actuated parts, can cause the oil to oxidize more rapidly and if foam is formed in the reservoir the probable overflow is unthoughtfully and a safety hazard.

During the last several years the economy of using high quality inhibited type hydraulic oils has been proven time and time again. Little wonder they are used almost exclusively today in machine tool hydraulic systems.

Mention has previously been made that viscosity is an important consideration in the selection of oils. Since pumps are the most critical part of a hydraulic system insofar as lubrication is concerned, pump man-

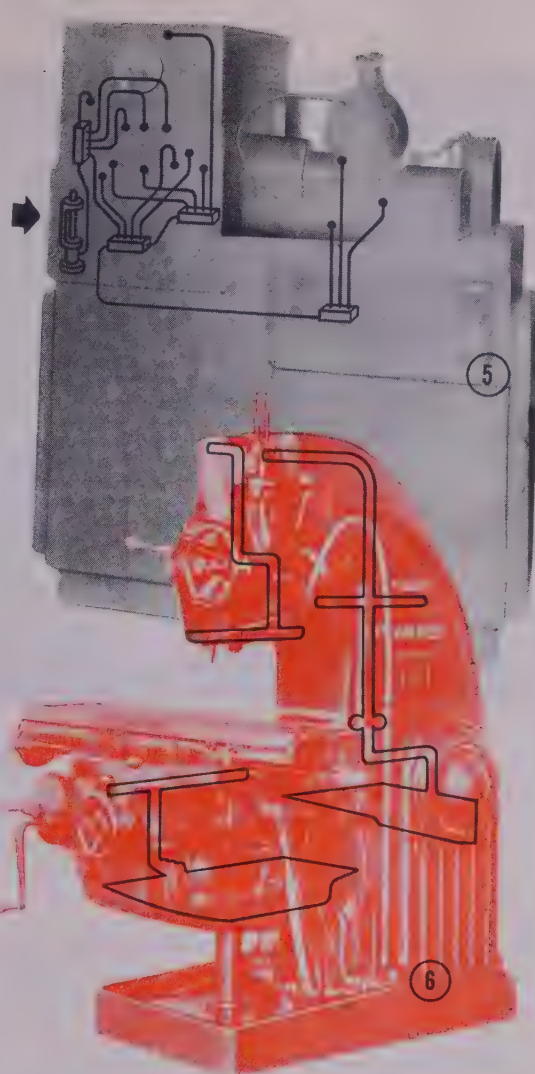


Fig. 4—Schematic plan of hydraulic and lubricating system of a 6-inch type C cylindrical grinding machine. Sketch courtesy Norton Co.

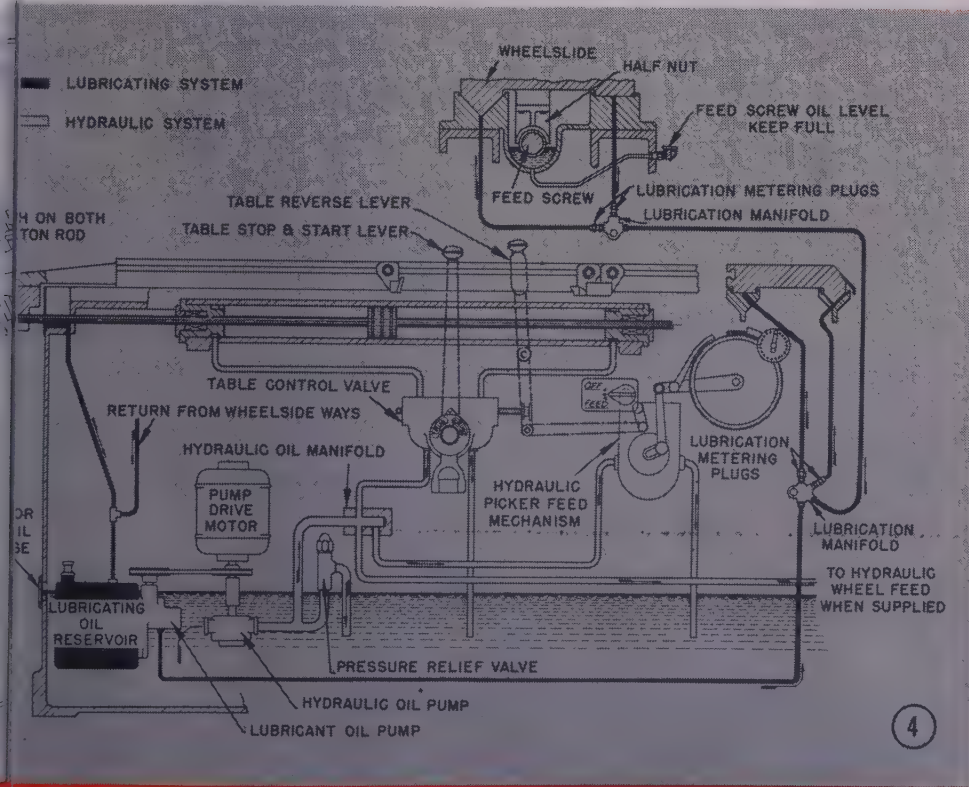


Fig. 5—Automatic oiling system for a thread generator made by Fellows Gear Shaper Co. Photo courtesy Bijur Lubricating Corp.

Fig. 6—Illustration of how one milling machine is lubricated by force feed from three reservoirs. In each case the oil is circulated to points of application by small pumps. Photo courtesy Kearney & Trecker Corp.

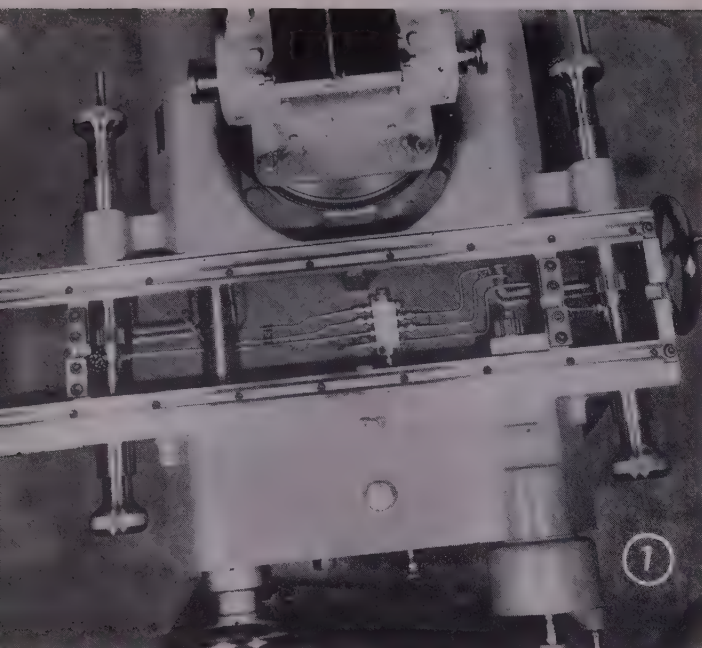


Fig. 7—Lubricating lines in the saddle of a No. 2 cutter and tool grinder, with table removed. Oil is fed to the distributor in the center from which it goes to the various bearings. Photo courtesy Cincinnati Milling and Grinding Machines Inc.

ufacturers have made extensive tests to determine what viscosity oil performs best in systems containing their pumps. It is necessary that the viscosity be sufficiently high to prevent metal to metal contact and to give high volumetric efficiencies, yet it must be low enough to pump easily so that pressure drop through the system is at a minimum. For these reasons pump manufacturers issue specifications indicating the correct viscosity to be used under various operating conditions.

Fortunately, practically all hydraulic pumps used on machine tools require the use of two grades or viscosities of oil, one being 150 and the other approximately 300 seconds at 100° F Saybolt Universal. For this reason, two grades of hydraulic oil are shown in Table I, but perhaps only one may be necessary in a given production shop.

General Machine Lubricant—Relegated to history is the general use of oil holes, oil cups or other manual means of applying oil to modern production machine tools. In the place of such devices centralized pressure, splash or similar forms of lubrication are now almost universally accepted. The great majority of production machines built today are so lubricated that little or no attention is required at time intervals ranging from a minimum of once a shift to long periods of time. Even machines lubricated once each shift are for the most part equipped with so-called "one shot" systems where it is necessary merely to pull out a knob to relubricate the machine.

Centralized systems range from "one shot" to completely automatic systems in which it is merely necessary to periodically replenish the reservoir with oil. Applications of such systems to machine tools are

shown in some of the illustrations accompanying this article.

Even though automatic lubrication is a feature of almost all production machines, remote spots which cannot otherwise be lubricated economically, may require application of oil by sight feed oilers or oil cups. These points must not be overlooked when relubricating.

Just as the use of automatic lubricating systems has become so common during the last few years, so has the use of inhibited lubricating oils for general machine lubrication. In fact some operators have found that using inhibited hydraulic oils for general machine lubrication has saved them money in maintenance and down time costs. One reason is that rusting is a detrimental factor in humid atmospheres and of course this can be overcome by the use of rust inhibited oils. The possibility of gum or sludge formation as the result of oil oxidation, and foaming caused by air being beaten into the oil are other detrimental factors which can be overcome by using inhibited oils instead of straight mineral oils.

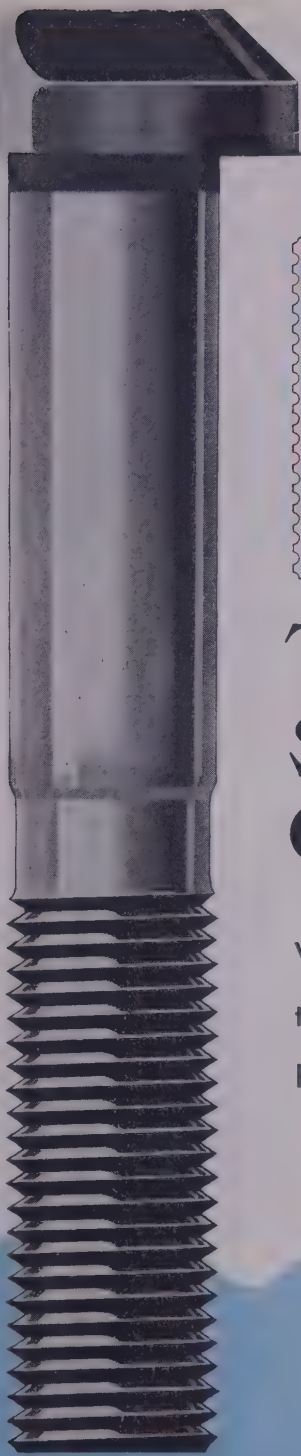
A fourth type of additive currently coming into specialized usage imparts extreme pressure characteristics. Oils containing such additives are now specified by several manufacturers whose tools contain heavily loaded bearings. Typical types of machine tools include some grinders for crush dressing, centerless thread grinders, and vertical turret lathes.

The great majority of machine tools require the use of a general machine lubricant having a viscosity of approximately 300 to 500 seconds Saybolt Universal at 100° F. However, certain tools may require an oil having a viscosity of only 200 seconds at 100° F. In general the lower the viscosity, the less will be the heat generated by internal friction in the oil. Low viscosity oils are used where distortion of machine parts, that is being caused by oil heating, must be minimized.

Based on present indications there are certain definite trends in general machine lubrication, i.e., the ever increasing use of automatic lubricating systems; general acceptance of machine lubricants containing inhibitors to prevent oil oxidation, rust and foaming; an increase in the use of extreme pressure agents in oils for use on certain types of machines; and a general lowering in the viscosity of the oil used as machines tolerances are decreased.

Other Gears Require Higher Viscosity—Some machine tools are equipped with gears which require a much higher viscosity product than that used as a general machine lubricant. Typical examples are found on some back gears of vertical or larger type horizontal turret lathes, column mechanisms of milling machines screw mechanisms on boring mills, etc. Such products usually fall within the SAE-90 or 140 viscosity grade, and the specific viscosity and type of product required is normally specified by the machine builder.

Gear lubricants insofar as type is concerned, fall within two classifications, straight mineral oil and extreme pressure lubricants. Straight mineral oil type gear lubricants should be well refined and highly resistant to oxidation. In addition, they should be so



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processed that they do not foam when mixed with air, or emulsify when they are contaminated with water.

With respect to extreme pressure gear lubricants, the lead soap base-type has been outstanding. This type is noncorrosive to copper or steel, has a high film strength, is unaffected by presence of moisture and does not thicken or oxidize appreciably in service. Lead soap base extreme pressure lubricants are recommended for use on all types of gears, including worm gears, for use on antifriction bearings contained in the gear case, on screws, and similar applications. For these reasons, this type is often used where both straight mineral and extreme pressure gear lubricants are specified by various manufacturers for their tools in a specific production shop in order to simplify the number of products used.

Sulphur-chlorine, "mild" type extreme pressure lubricants can also be used on gears but before doing so it should be ascertained if they are corrosive, or will stain steel or copper.

Gear lubricants are normally contained in reservoirs, the gears being lubricated by splash or by a forced feed system. A few specialized machines contain what are termed open gears, that is, they are not contained in an oil tight housing. In such cases, it is necessary that an adhesive type gear lubricant be applied directly to the gears. Such products are made from heavy residual stocks and are sufficiently adhesive and cohesive that they will not throw off.

Spindles Need Proper Lubricant—High speed spindles on grinders and similar types of tools require extreme care in the selection of the proper lubricant. Spindles may be either grease or oil lubricated depending upon the design.

With respect to oil lubricated spindles, speed and load on the bearings are two primary considerations

in the selection of a proper lubricant. Other factors, however, such as the type of bearing involved, possibility of contaminants (grinding dust for example) entering the bearing housing and method of lubricant application also play an important part in the choice of a lubricant.

It is absolutely essential that there be no play in spindles, therefore, clearances are held to a minimum. Also, there has been a definite trend toward higher spindle speeds. As clearances are decreased and speeds increased, it is normally necessary that the viscosity of the lubricant be lowered. It is for this reason that some manufacturers specify very low viscosity oils for spindles.

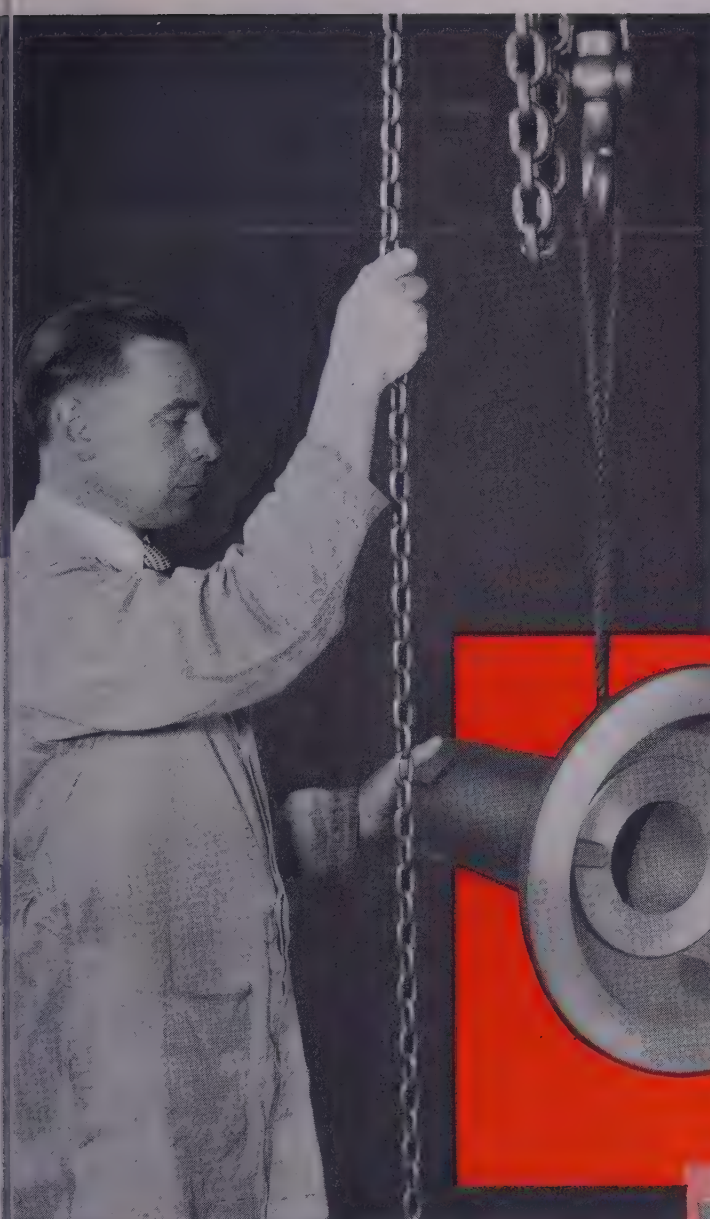
The reasons for using low viscosity products on modern high speed spindle bearings is simply that if high viscosity products were used, the bearings might overheat and ultimately seize, the hot oil would oxidize more rapidly and the hot metal surrounding the oil would expand, thus affecting the accuracy of the machine.

Spindle bearings range in design all the way from sleeve type bearings to three part bearings (half box located at the bottom and to the rear of the spindle housing with two adjustable bearing segments on top), three or five pivoted shoe types and, of course, antifriction bearings.

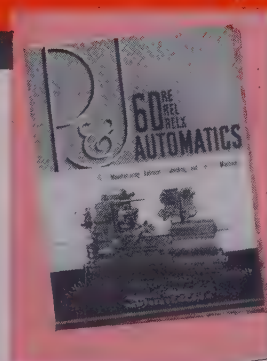
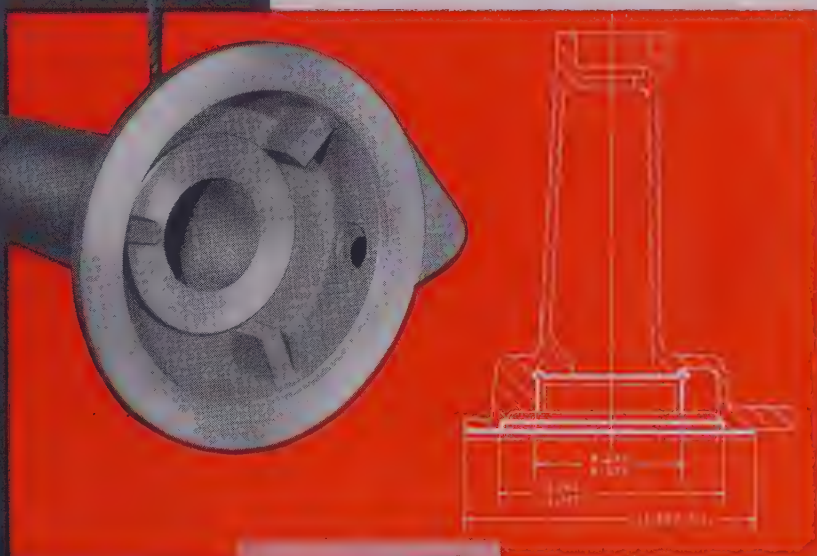
Oil lubricated spindles require products ranging in viscosity from 40 to 300 seconds at 100° F Saybolt Universal depending upon factors discussed above. Although general recommendations can be made, as indicated in Table II, it is best to follow the manufacturers' recommendations as to the correct viscosity of oil to use in a specific spindle. In general sight feed oilers, wick oilers, and ring oilers are to be found on comparatively low speed spindles, whereas flood and mist type lubrication are used on higher speed

TABLE I
SIMPLIFIED LUBRICANT RECOMMENDATIONS FOR MACHINE TOOLS

Parts To Be Lubricated	Approximate Grade (Unless Otherwise Shown in Sec. Say. Univ. Viscosity)	Product Description
Hydraulic System		
Low Viscosity	150 at 100° F.	Hydraulic oil inhibited against rust, oxidation and foam
Medium Viscosity	300 at 100° F.	
General Machine Lubricant		
Low Viscosity	200 at 100° F.	High quality mineral oil, preferably inhibited against oxidation, rust and foam
Medium Viscosity	300 at 100° F.	
High Viscosity	500 at 100° F.	
Gears (Not lubricated by general machine oil)		
Lightly Loaded — Other Than Worm	SAE 90 or 140	High quality mineral oil Lead soap base, non-corrosive, mild type, extreme pressure lubricant
Heavily Loaded — Other Than Worm	SAE 90 or 140	
All Worm Gears	SAE 90 or 140	
Spindles		
Oil Lubricated		
By Oilers and Wick Feed	100-200 at 100° F.	High quality mineral oil
By Ring Oiler	200-300 at 100° F.	
By circulating of Flood System	40-300 at 100° F.	High quality mineral oil, preferably inhibited against rust and oxidation Mixed base (sodium-calcium) premium grade anti-friction bearing grease, highly resistant to oxidation
By Oil Mist	40-150 at 100° F.	
Grease Lubricated	NLGI Grade No. 2	
Ways		
Lightly Loaded		
Medium Viscosity	300-500 at 100° F.	Well refined straight mineral oil, or use general machine lubricant, if viscosity same
High Viscosity	700-1000 at 100° F.	
Heavily Loaded, or where Chattering Occurs		
Medium Viscosity	300 at 100° F.	Oils containing oiliness and extreme pressure qualities, as well as ability to withstand pressing out
High Viscosity	1000 at 100° F.	
General Grease Lubrication		
Normal Operation	NLGI Grade No. 2	Mixed base (sodium-calcium) premium grade anti-friction bearing grease, highly resistant to oxidation Sodium base grease made with refined residual oils
Heavy Duty Operation	NLGI Grade Nos. 1 or 2	
Dual and Tri Purpose Oils for Multiple		
Spindle Automatic Screw Machines		
Dual Purpose — Machine Lubricant and Cutting Fluid	150 at 100° F.	Non-corrosive sulphurized mineral oil
Tri Purpose — Hydraulic Fluid, Machine Lubricant and Cutting Fluid	260 at 100° F.	



SOLVES A
*housing
problem*



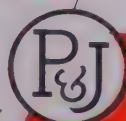
REAR axle housing, that is. Note the size... the 45° angular recess... the number of operations (12) for rough and precision-finish boring, spading, chamfering, facing...

This class of work is a natural for the P&J Automatic; with this Machine tooled the P&J way, you have a most efficient setup for today's high-speed, close-tolerance requirements. When next you figure on the precision-production of quantity duplicate parts, give consideration to P&J's specialized know-how — and the profitable combination of P&J Tooling on P&J Automatics.

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**PRODUCTION TOOLING
HEADQUARTERS**

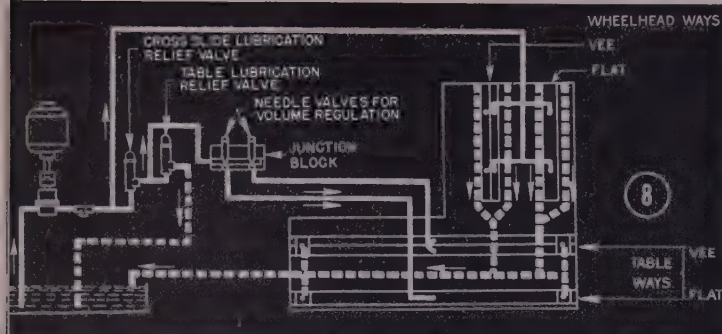


Fig. 8—Diagram of lubrication system on ways of a 4-inch plain hydraulic grinder. Sketch courtesy Cincinnati Milling and Grinding Machines Inc.

TABLE II
RECOMMENDED SPINDLE LUBRICATION

Method of Oil Application	General Viscosity Range of Oil, Say, Univ. Seconds at 100° F.
Sight feed oilers	100-200
Spring-actuated wick feed..	100-200
Ring oiled	200-300
Flood or circulating.....	40-300
Oil Mist	50-150

bearings, with mist being used at very high speeds.

In systems where the oil is circulated to the bearings and back to a reservoir (ring oiled, splash, flood or force feed) it is essential that the product used be of good quality. The oil must be resistant to oxidation, not emulsify with any water of condensation or contamination, and quickly free itself of any entrained contaminants, such as grinding dust. In both circulating systems and with mist lubrication, when applied to antifriction bearings, it has been found that rust is sometimes a factor which can cause serious bearing damage. In order to overcome this, rust inhibited oils have been resorted to with complete success.

So far, this discussion has concerned oil lubricated spindles only. However, where there is a possibility of oil leakage, or under conditions where dirt, dust and other contaminants can get into the bearing, grease is often used. In such cases, a premium grade antifriction bearing grease of a No. 2 NLGI consistency should be used.

No discussion on spindle lubrication would be complete without a word on cleanliness. High speed spindle bearings can be ruined by small particles of dirt. For this reason, air used in mist lubrication should be filtered to removed entrained dirt and moisture. Every effort should be made, also, to keep contaminants out of circulating oils and if the oil does become contaminated, it should be changed immediately.

Way Lubricants Recently Developed—No matter how well a machine tool is designed, if the ways are not properly lubricated accurate machining cannot be accomplished. Off hand, one would think it simple to lubricate two flat or V shaped surfaces upon which a carriage, turret or work rest must ride. Quite to the contrary, however, this is one of the critical points in machine tool lubrication and a great deal of research has been conducted by both machine builders and oil suppliers on this problem. As a result of some of this work, new "special" way lubricants have been developed recently and are receiving ever increasing acceptance.

One of the primary problems encountered on many machine ways was chattering, which caused irregularities in the work being done. Since chattering normally occurs just after motion has been reversed, the

most common theory was that on the forward motion oil was wiped off the way, then as motion was reversed the carriage had to traverse a comparatively dry way before the oil supply could be replenished.

Another problem was that if the carriage was stopped the lubricant had a tendency to press out with the result that when the carriage was again moved it occurred in a "stick-slip" motion. Chattering predominates on some milling, shaping, grinding and similar type machines where the carriage goes back and forth at predetermined cycles. "Stick-slip" motion is of primary concern on such equipment as lathes where tools at times are advanced into the work a fraction of an inch.

In addition to overcoming the above problems, way lubricant must have other properties as follows. It should eliminate chatter, it should not press out upon standing, it should contain oiliness and extreme pressure agents to prevent metal to metal contact between localized high spots, the oil film thickness built up should not be sufficiently thick to affect the accuracy of the work being done; it is essential that it be noncorrosive to steel or the copper found in the oil distribution system; it should not plug felt filter found in some centralized systems, and it should not wash off or be adversely affected by cutting fluids, coolants or water.

Way lubricants having all the above desirable qualities have been developed and placed on the market in the last several years. Where chattering or "stick-slip" troubles have been encountered with straight mineral oils, oils compounded with fatty material or even lead soap base gear lubricants, these troubles have been eliminated by the use of "special" way lubricants.

A variety of type of lubricants may be used on ways, depending both on the load and method of lubrication. Where loads do not exceed approximately 10 pounds per square inch, a straight mineral oil having a viscosity of about 300 seconds at 100° F Saybolt Universal is used, unless the manufacturer of the machine specifies a somewhat heavier grade of lubricant.

When loads are above 10 psi it is usually necessary to use a high viscosity straight mineral oil, or more often, a fortified mineral oil. In the past compounded oils, containing fatty material which increases "oiliness," and various types of extreme pressure gear lubricants have been used, with success ranging from good to only fair. It is confidently

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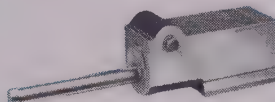
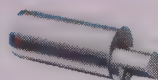
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believed, however, that the machine tool industry will standardize on the use of special way lubricants such as the type described at the beginning of this section when something more than a straight mineral oil is required.

Cross slide ways and comparatively short ways may be lubricated through oil cups or by similar methods, but longer ways are almost universally lubricated through "one shot" or other forms of a centralized distribution system. Most are automatic so that on each stroke the ways receive a shot of oil.

Ways on some machines are lubricated from the hydraulic system or headstock. In such instances, small diameter copper tubing conducts the oil from the hydraulic circuit or headstock to the ways. It is necessary that the lubricant serve the dual purpose of hydraulic or headstock and way lubricating oil. At the present time only some light duty machines are designed in this manner and the choice of a suitable lubricant requires specialized attention. In a few instances ways are lubricated by excess cutting fluid splashing on the ways.

Greases Find Application—Modern machine tools are predominantly oil lubricated; however, grease is used on electric motors, coolant pumps, on some spindle bearings and on miscellaneous applications such as toggle mechanisms, sliding surfaces (other than ways) and some inaccessible bearings.

Experience has shown it is generally desirable to stock only one grease for all grease applications and in such instances, the type of grease used is dictated by the requirements of high speed grease lubricated spindles or electric motors. In these applications a premium grade No. 2 NLGI grease containing a sodium-calcium mixed base soap, a mineral oil with a viscosity of 150 to 400 seconds at 100° F Saybolt Universal and an inhibitor to retard oxidation is used.

Such a product has proved entirely satisfactory on high speed antifriction bearings such as found on spindles and electric motors and at continuous operating temperatures up to about 250° F. In a few cases, on particularly large or heavy duty equipment a sodium soap base grease containing a high viscosity oil is required, for such a product will withstand heavier loads than will the type recommended for electric motors and spindles.

On many older machines, plain bearings were used extensively and for these an ordinary cup grease was used. Even though many of these machines are still in operation, most operators now use the type of grease required for antifriction bearings (described above) for such points. It is often found more economical to carry only one grease for all grease lubricated points rather than two greases, one for antifriction bearings and a cup grease for plain bearings. Some operators have gone so far as to say that the mere possibility of exchanging these two types, resulting in the almost certain failure of high speed antifriction bearings is sufficient reason to preclude the stocking of a cup type grease for use on plain bearings.

Application of grease on modern machine tools have been greatly simplified. In the past it was necessary to circle the machine completely to reach all

points. The modern trend is definitely toward the use of a centralized distribution system or, at least, to supply a centralized panel equipped with pressure grease fittings and connected to various bearings by suitable tubing, thus making it almost impossible to miss an isolated bearing.

Dual or Tri-Purpose Oils—No simplified lubrication plan for machine tools would be complete without consideration of a special problem which arose in the case of some multiple spindle bar and chuck type automatic screw machines. This problem related to the maintenance of the correct cutting oil in these machines for it was found in some instances the machine's lubricant, and sometimes the hydraulic oil were diluting the cutting oil in sufficient volume to reduce the active ingredients in the cutting oil. In a few instances, the direction of the dilution was reversed; in these cases, the cutting oil being the offender by contaminating the lubricating and/or hydraulic oil, thus resulting in sludge formation, corrosion and ultimately ruined machine parts.

To overcome this situation, dual purpose oils were developed which could be used as general machine lubricant as well as the cutting fluid on bar type automatics. Subsequently, their use was extended to the hydraulic system on chuck type automatics resulting in their accepted classification as tri-purpose oils.

Dual or tri-purpose oils are noncorrosive to steel or copper. Years of experience has shown them to function efficiently as a machine lubricant and as a hydraulic fluid in these systems. In addition, they give excellent tool performance on all machining operations which are considered mild or slightly on the tough side. Even on "difficult" jobs the effect of dilution from that portion used in the lubricating system will be far less than if straight mineral oil had been used in the latter.

It is absolutely essential that only fresh clean oil be added on the lubricating side of the machine. Oil from the cutting oil sump should never be added to the lubricating oil reservoir for if it is, the chips in the latter would soon cause serious damage to the bearings.

Machine tool manufacturers are to be complimented on the ever-increasing attention being given lubrication. Many manufacturers have devoted a great deal of time and effort in order to determine the most satisfactory grades of lubricants to be used; they are very conscious of their responsibility to their customers in passing this information on to them.

Machine tool manufacturers also are designing modern tools so that a minimum of attention can be given relubrication. Methods used include the almost universal acceptance of centralized lubricating systems with their many advantages of positive lubrication and savings in labor and maintenance costs.

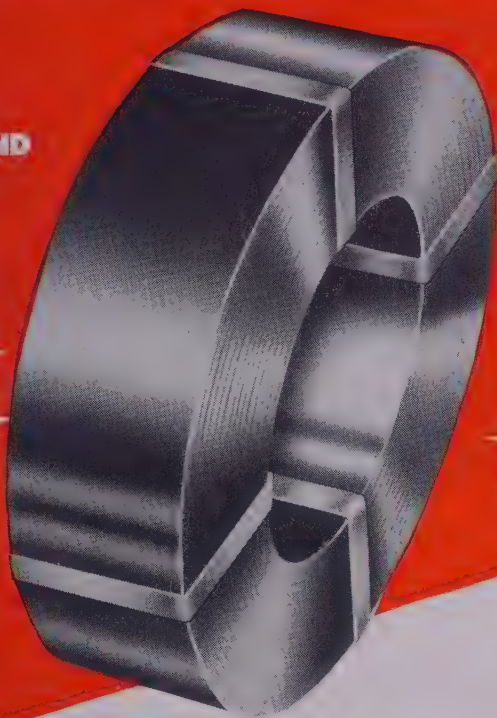
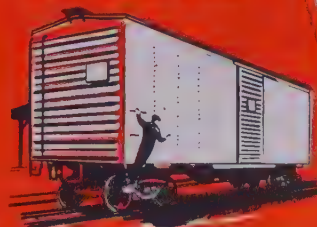
The petroleum industry, too, is proud of the lubricants developed in recent years which make it possible to use a single product over an ever broadening range of conditions. Modern lubricants also function over much longer periods of time. Such lubricants permit the development of a simplified lubrication plan as described in this article.

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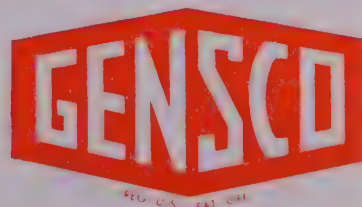
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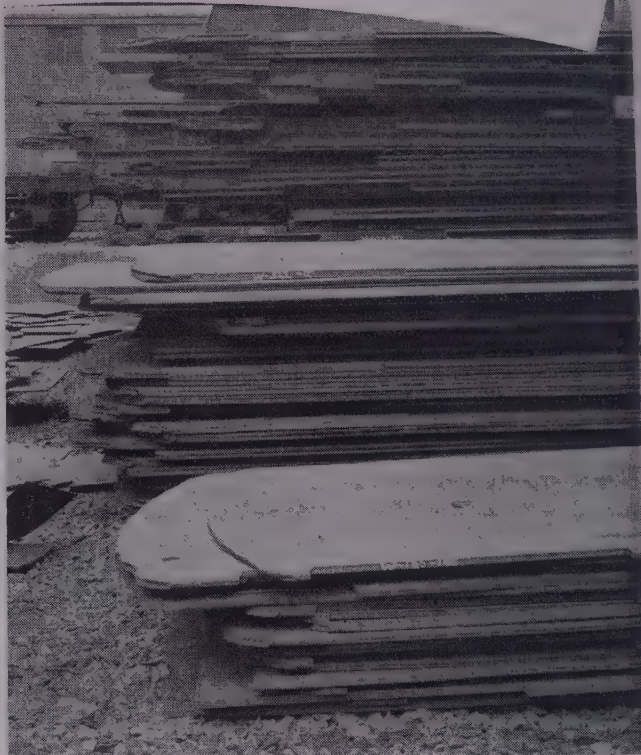
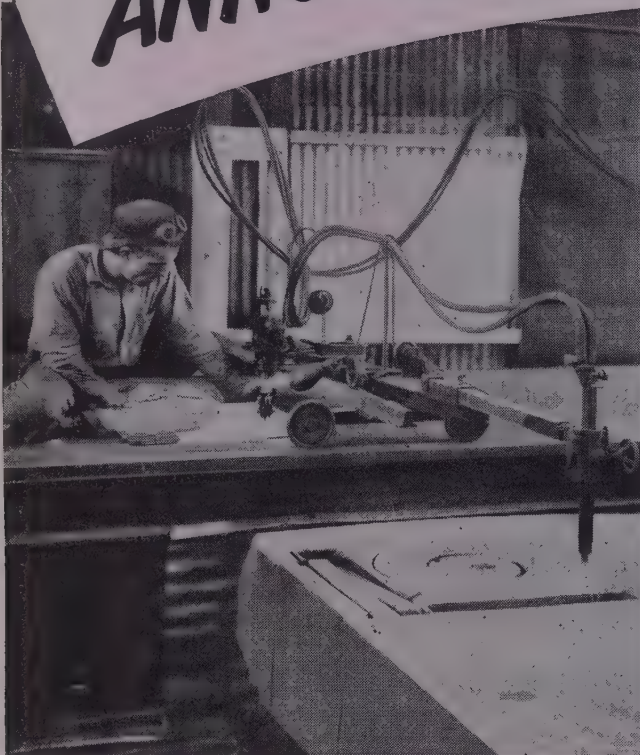
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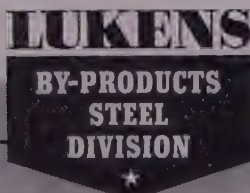
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Strip and Sheets

In this fifth section, the author continues his discussion of cold-rolling mills with a description of tandem units. He also discusses annealing of both hot and cold-rolled material and equipment utilized

By CHARLES L. McGRANAHAN

Assistant General Superintendent,
Pittsburgh Works
Jones & Laughlin Steel Corp.
Pittsburgh

PART V

TANDEM MILLS, for the cold reduction of high and low-carbon steels and stainless steel, consist of from three to five stands of rolls of the four-high or cluster type equipped with a coil box or feed reel on the entry side and a tension reel on the delivery side of the train. All recent installations employ a belt wrapper for winding the entry end of the strip around the tension reel block, thereby eliminating stopping of the reel in a certain position and the insertion of the end into the reel gripper-jaws.

There has been a growing tendency during the last decade to employ higher delivery speeds with the result that the latest 93-inch three-stand tandem mill delivers strip at 1600 feet per minute and the last two five-stand tandem tin plate reducing mills built have delivery speeds in excess of 5000 feet per minute, one being over 6000 feet per minute. It is apparent that such speeds require large coils, otherwise

the mill will be continually accelerating and decelerating, also that driving motors of very high horsepower are necessary. The first problem has been solved by welding several coils together on the continuous pickling line, producing weights up to 60,000 pounds for tandem sheet mills and 30,000 pounds for four and five-stand tandem tin mills. The problem of adequate mill motor size has been met successfully by furnishing 4000 horsepower motors on each stand of the 93-inch three-stand tandem mill and motor capacities ranging from 1750 to 4000 horsepower on stands Nos. 1 to 5 of the tin plate tandem mill. It

Fig. 39—View of rear side of three-stand tandem mill showing arrangement of motor drives and pinion stands. Working roll changing-rig is standing adjacent to No. 3-stand motor. Continental Roll & Foundry photo

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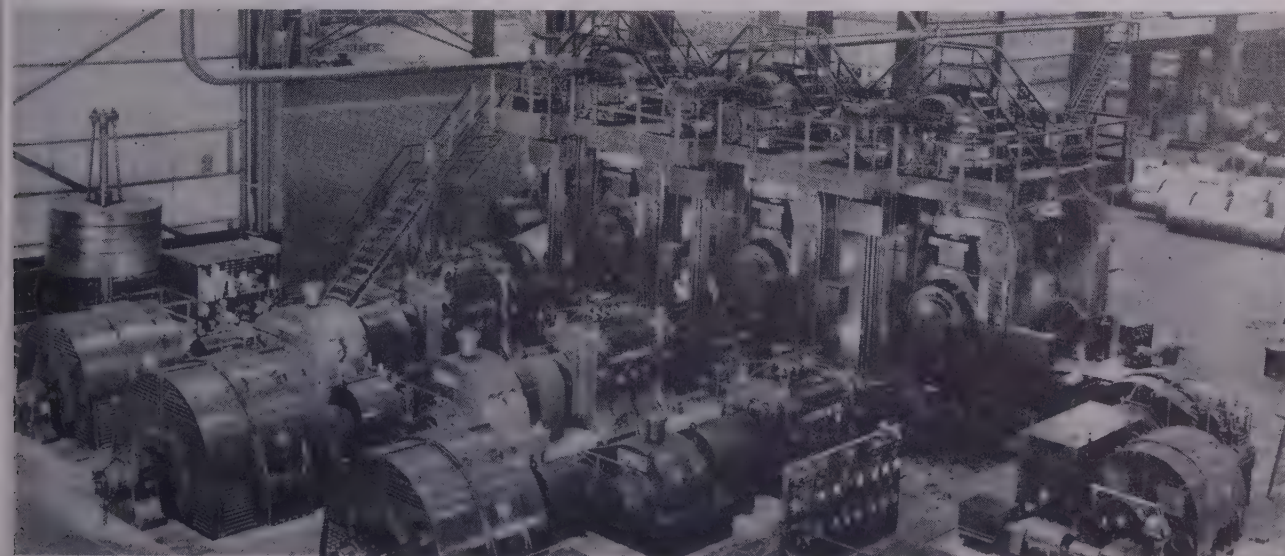


TABLE III
MOTOR CHARACTERISTICS AND GEAR RATIOS

Stand	Motor hp	Motor rpm	Ratio drives	Speed fpm
No. 1	1750	80/240	1/1	450/1351
No. 2	3500	150/360	1/1	844/2026
No. 3	3500	175/350	1/1.525	1502/3004
No. 4	3500	200/400	1/2	2251/4503
No. 5	4000	275/535	1/2	3096/6023
Delivery reel	600			

will be noted from the perspective sketch of a tandem tin plate mill, Fig. 40, that stand No. 1 is driven by a single motor; No. 2 stand is driven by a twin-armature motor; stands No. 3 and No. 4 are drive by two single-armature motors, and stand No. 5 is driven by two twin-armature motors. The reel drive is considered a single motor even though it is made up of two units. Table III shows the motor characteristics and gear ratios.

Two motor-generator sets, each driven by a 10,000 horsepower motor, furnish a total of 14,200 kva of power at 750 volts.

Individual working rolls of stands Nos. 3, 4 and 5 are driven by separate motors and are not locked together by a conventional pinion stand as is done on a stand utilizing a single motor or two motors arranged end-to-end in tandem.

For flexibility of operation, each stand motor of the 93-inch three-stand tandem mill and the five-stand tandem tin mill, as well as the reel, is equipped with an individual motor-generator set. Such an arrangement permits a wide range of mill speeds, mill drafting and finished gages.

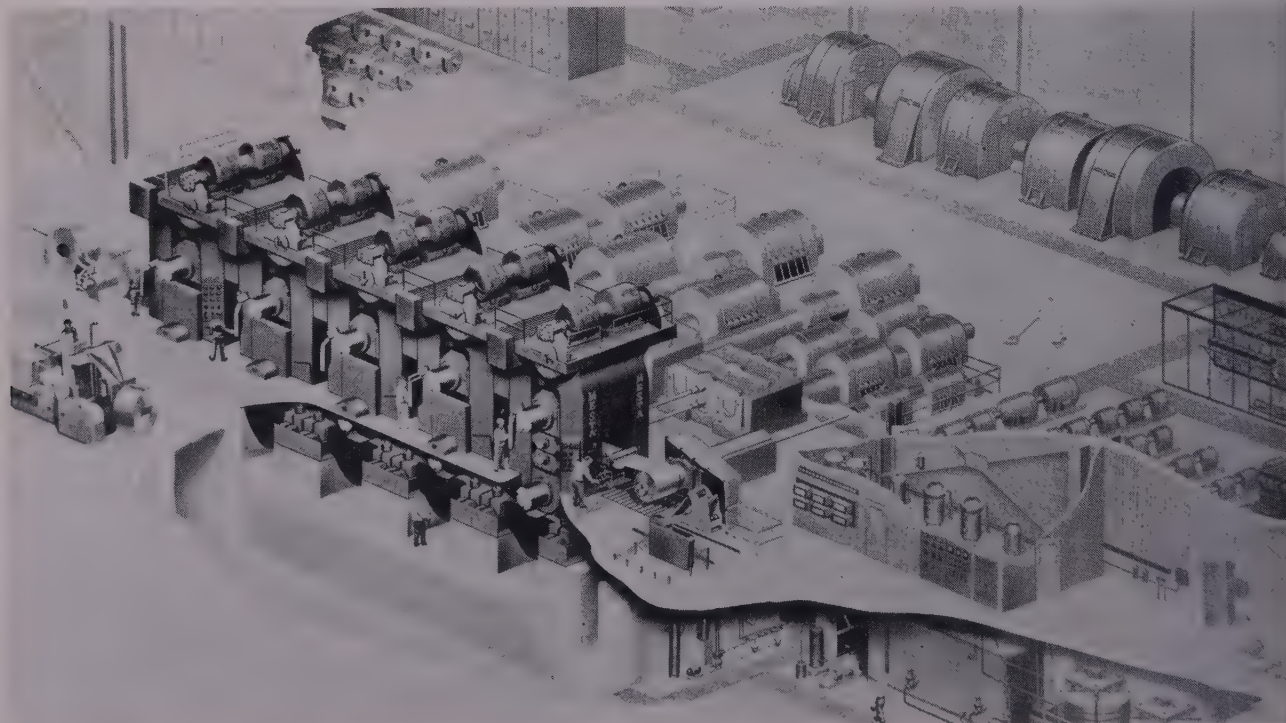
Three-stand tandem mills use filtered water, which is wasted, as a roll coolant or they may be equipped with a recirculating system for handling a mixture of soluble oil and water. High speed tandem tin plate mills use a mechanical mixture of palm oil and water,

salvaging the used oil by a recovery system, or they may use a recirculating system with a mixture of soluble oil, palm oil and water. Air jets on the finishing stand delivery side are used to remove the excess coolant before the strip reaches the reel.

A continuous indication of the finished strip gage or the gage between two of the stands, is obtained by means of a flying micrometer. Such a device is provided with two hardened rollers which make contact with the top and bottom of the moving strip. By means of suitable electric circuits the opening is registered on a dial graduated to show plus or minus variations from desired thickness. The indicating pointer is set at zero by means of a standard thickness gage before the movable head is placed on the strip. It is difficult if not impossible to accurately indicate gage on strip moving over 4000 feet per minute in which case an x-ray gage is used. This device employs a 50,000-volt or a 100,000-volt x-ray tube and by suitable means gives an accurate gage indication by measuring the absorption of rays by the moving strip and then comparing it with a standard of the desired thickness. Contact with the strip is not necessary and vibration of it does not affect gage accuracy.

Low-carbon steel sheets made from rimming steel are usually given a 60 per cent reduction on a three-stand tandem mill while sheets of non-aging characteristics receive about a 40 per cent reduction. A 20 gage (0.0359-inch) rimmed-steel sheet is therefore produced from a 0.090-inch pickled hot band. Tin plate is usually given about 90 per cent reduction, a 0.090-inch band being used for 32 gage (0.0094-inch)

Fig. 40—Perspective view of the world's fastest tandem cold reduction mill for tin mill products. This unit rolls at speeds in excess of 6000 feet per minute. J & L sketch



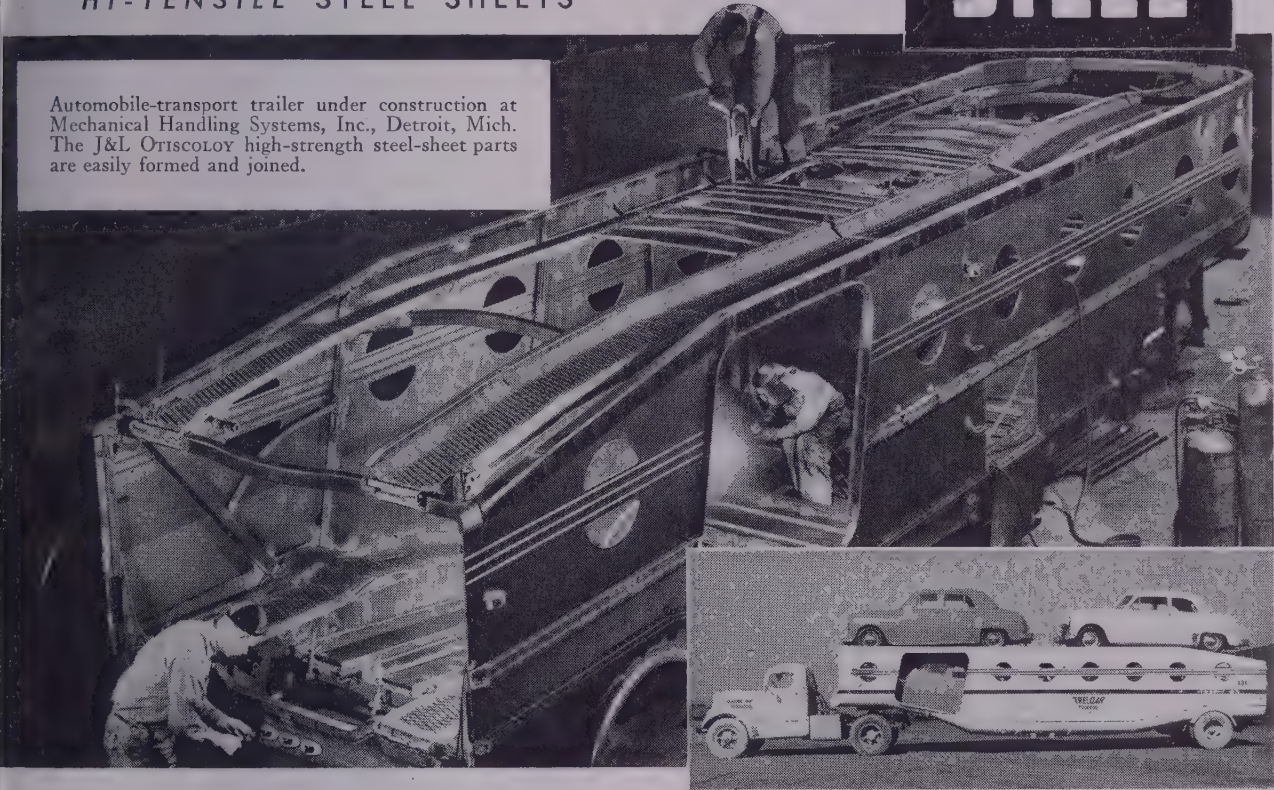
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the next coil is fed into the first stand as soon as the tail-end drops out of the working rolls. Off gage is produced during the accelerating and decelerating of the mill but this is kept to a minimum by use of the belt wrapper and a fast accelerating time, a properly designed mill producing the desired gage at half operating speed. It is needless to point out that considerable skill is required by the rolling crew to produce the proper gage and desired flatness by manipulation of drafts, tension and mill coolant. Product from a tandem mill may be annealed without removal of the residual rolling oil or coolant unless it is to be coated, in which case it is cleaned on an electrolytic cleaning line.

Type of annealing equipment required for heat treatment of hot-rolled and cold-rolled sheets and strip is determined to a large extent by the temperature to which the product must be raised to secure the desired physical properties plus the length of time it must be maintained at this temperature. When temperature is above 1400 degrees F continuous open-type furnaces are used and when it is under 1400 degrees F some form of box annealing furnaces are provided.

Open-type furnaces are usually called blue annealing or normalizing furnaces, Fig. 41, and convey their product through the furnace either by a roller hearth, a chain conveyor or by walking beams, all of the conveying equipment within the furnace being of heat-resistant alloys. Sheets to be heat treated are carried through the furnace on waster sheets to prevent scratching of the product and any oxide pick-up from the conveying rollers, chains or beams. While low-carbon waster sheets may be used for low temperature annealing, heat-resistant alloy 28 per cent chrome or 25 per cent chrome and 12 per cent nickel-alloy sheets are required for higher temperature heat treatment.

The furnaces may be as large as 9 feet wide with a length varying from 70 to 200 feet depending upon the capacity required and type of annealing desired. Fuel may be liquid or gaseous and is usually regulated by automatic temperature control equipment. A single furnace will do either open annealing or normalizing and is divided into a heating, soaking and cooling zone, the cooling being provided by water pipes or water cooled conveyor shafts.

When the desired physicals are secured at a furnace temperature of 1600 degrees F in a heavily-reducing atmosphere, the operation is termed blue an-

Fig. 42—Outline of typical catenary furnace with heating and cooling chambers. General Electric sketch

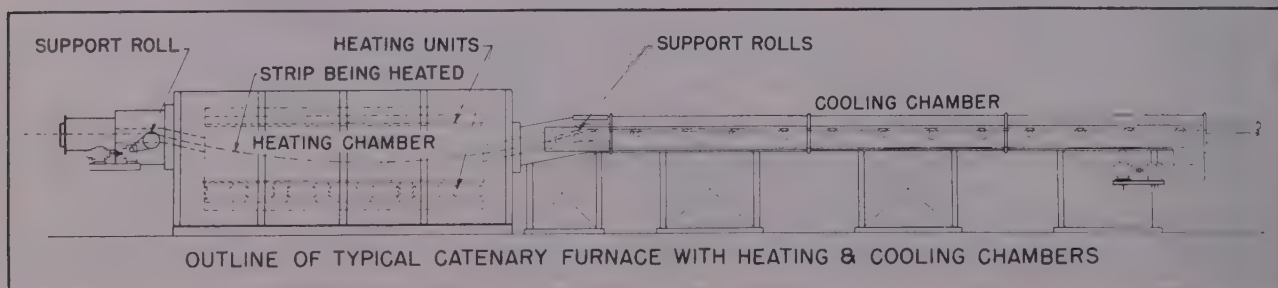


Fig. 41—Feeding end of blue annealing and normalizing furnace. Nearest workman is feeding heat resistant alloy carrier sheet into pinch rolls. J & L photo

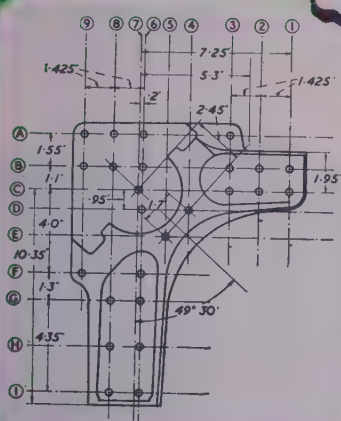
A considerable tonnage of tin plate is produced upon four-stand tandem mills starting with a 0.070-inch pickled band, however, the most popular use for such mills is the production of light gages for galvanizing, light narrow strip and stainless steel.

Individual stands, on modern three-stand tandem mills, are usually placed about 16 feet apart and those of the five-stand tandem tin plate mills are about 12 feet apart. By increasing this distance up to about 25 feet it is possible to put conveyor tables between the stands and to roll pickled sheets down to proper cold rolled thickness. Such layouts are in practical operation in European mills.

The tandem mill is threaded like a single stand four-high mill at a speed of about 200 feet per minute and brought up to running speed in 6 to 8 seconds after the leading end has been attached to the reel head, either by the belt wrapper or by being gripped by the jaws in the reel block. Gage is secured by a combination of roll pressure and tension between the various stands as well as between the finishing stand and the tension reel. When the tail-end of the coil is about to leave the coil box or feed reel, the mill is decelerated to threading speed and the head-end of

BULLARD SPACER *Goes Abroad*

The de Havilland Aircraft Co., Ltd., are getting good results with a Bullard Man-Au-Trol spacer unit which they are now using in conjunction with an Asquith O.D.I. radial drilling machine in their Hatfield works. By eliminating jiggling or marking out in the drilling of a large range of components produced in comparatively small batches, the spacer has cut costs and speeded production. Fig. 1 shows the Asquith radial drill equipped with the spacer unit in use on a comparatively small job for a table of this size, but its versatility may be claimed as an advantage of the device, for it will deal equally well with any work within its capacity. Peacetime production of aircraft obviously calls for a good deal of comparatively small batch work. At de Havilland's they have tooled up extensively for production of their Dove aircraft of which they have sold a large number. But others of their machines are going through in small lots, prototypes and "pilot" production. For this class of work involving machining a few off of widely different components, the company are already satisfied that the Man-Au-Trol spacer unit offers interesting possibilities. It has the advantage, too, that it will work to quite close limits — the makers claim an accuracy of 0.001 in. in spacing.



Co-ordinates of the various holes are shown superimposed on this drawing of the component. Each hole is identified by one letter and one number for setting on the handwheels.

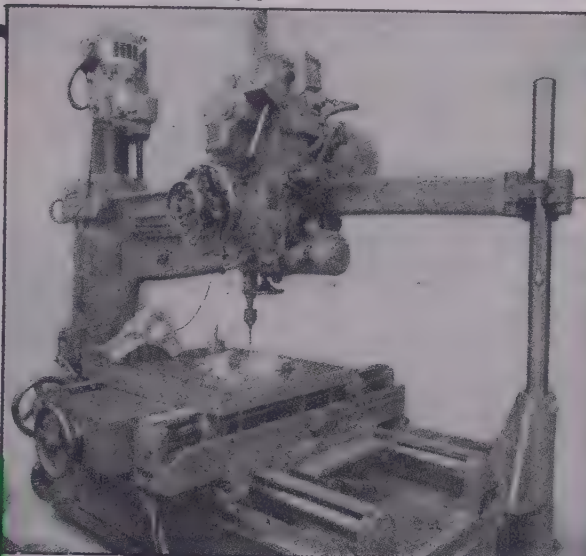


Fig. 1.—At de Havilland's the Bullard Man-Au-Trol spacer unit is mounted on an Asquith O.D.I. radial drill, the arm of the machine being secured by a clamp to an outer supporting column mounted on the base.

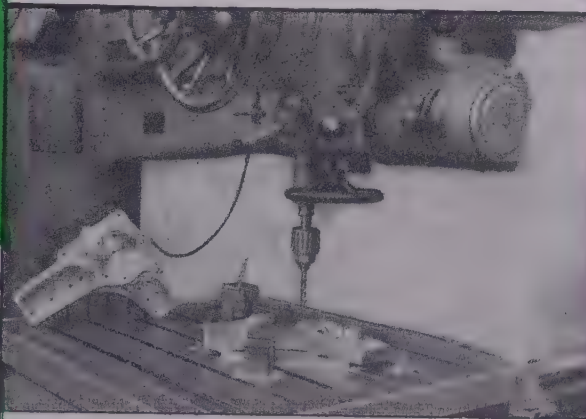


Fig. 2.—Close-up of the table, showing a typical job clamped to the surface ready for drilling. A completed component is also shown on the left of the photograph.



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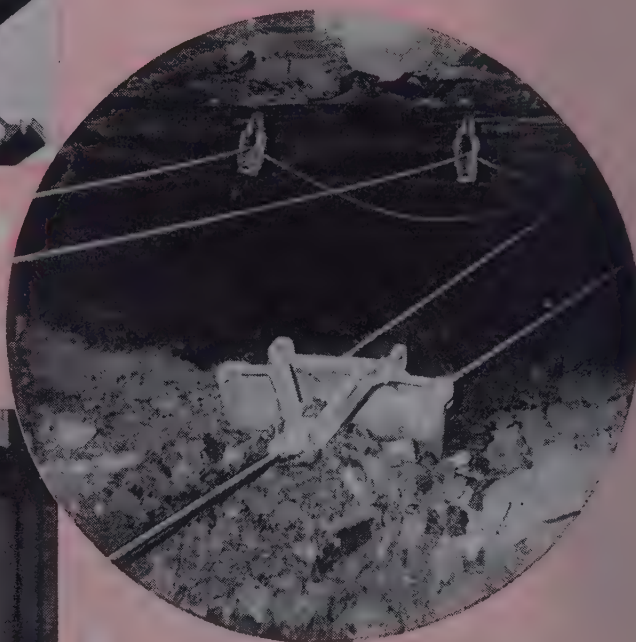
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leaving and a product having a light blue scale is produced. Sheets of this type are suitable for flat work or a 90 degree bend but if intended for a part requiring any appreciable amount of drawing, they must be pickled.

When the furnace is operated at a temperature of from 1875 to 2000 degrees F in the heating zone and the sheet remains in this zone for a period of at least three minutes and then cooled at a controlled rate, the procedure is termed as normalizing by operating people. A normalized product must always be pickled before any further processing can be done to it. This is due to the hard scale that is produced in the heating operation even though the atmosphere may be reducing.

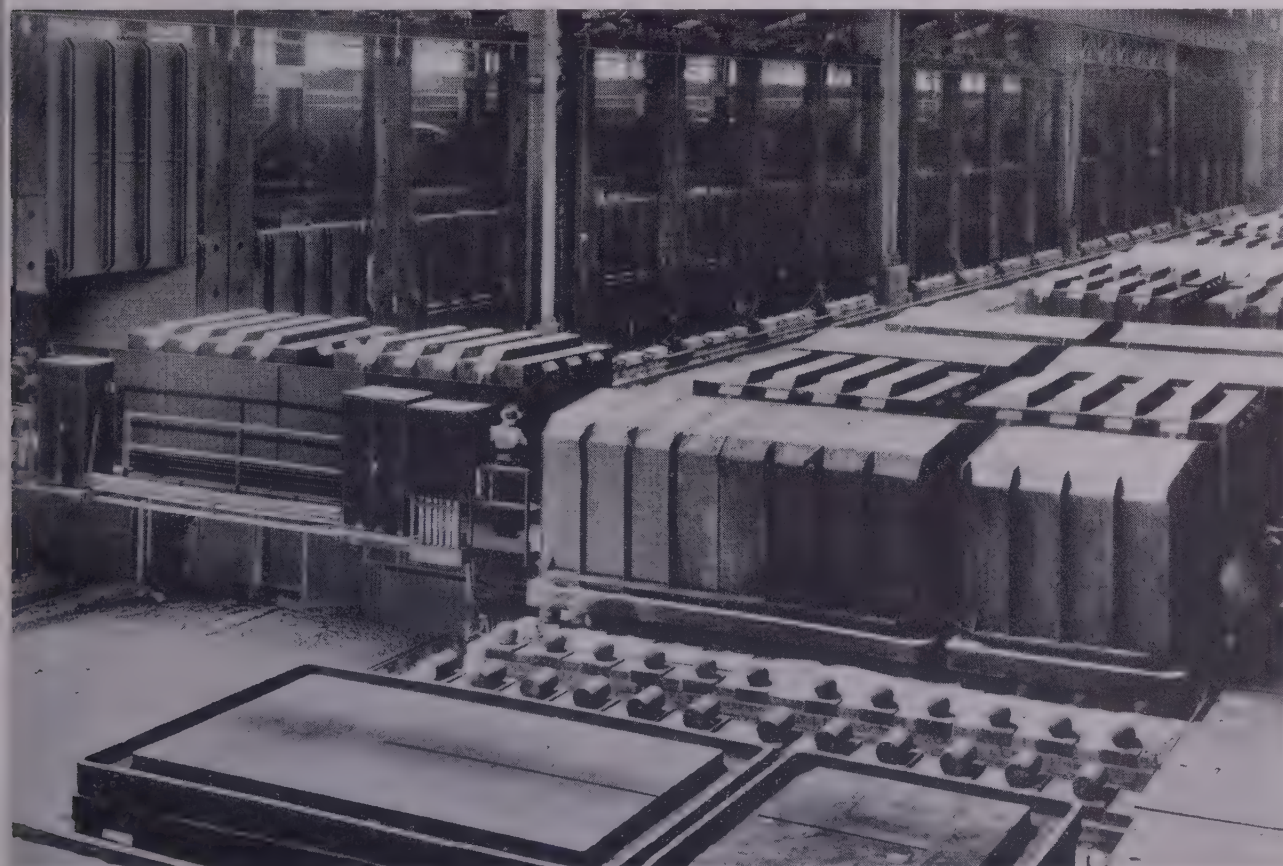
It is possible to do bright annealing of cold-rolled strip in equipment very similar to that described above by substituting electric heat or gas-fired radiant tubes for open burners and maintaining a gas-tight shell on the furnace. A deoxidizing atmosphere made from natural gas or cleaned coke oven gas is used for filling the furnace chamber or dissociated ammonia gas, should the product be stainless, silicon or high-carbon strip. The strip is supported on alloy rollers in its passage through the furnace and use of waster or rider sheets is not required. If the furnace is not too long, the strip may hang in a catenary, Fig. 42, thereby eliminating use of any rollers within the heating zone. This type of annealing can be performed rapidly but at the expense of some softness in quality.

When heat treatment of sheets and strip can be

carried out at temperatures of from 1150 to 1400 degrees F, the operation is performed in sealed boxes which are placed either in heating furnaces or a portable heating furnace is placed over the box of steel. This type of heat treatment is termed box annealing and the furnaces are called batch furnaces, portable furnaces or cover-type furnaces.

Modern batch annealing furnaces, Fig. 43, are usually arranged in batteries of four and consist essentially of a chamber about 12 x 28 feet with a combustion chamber located along each side. Fuel may be either gas or fuel oil. The product consisting of sheets or coils, is loaded upon a cast-steel base which has a trough around all four sides. A cover of welded steel plate (5/16-inch thickness) construction is placed over the load and sealed with sand by filling the above mentioned trough. A machine, called a charging car, picks up the load and places it in the furnace after which the door is closed and the furnace and charge are brought up to a temperature which experience has indicated will bring about the desired hardness and ductility which the final use of the steel dictates. Thermocouples are installed in the roof of the furnace and usually in the top and bottom of the pile of sheets or coils. There will be a lag of about 100 degrees F between the temperatures of the top of the pile of sheets and the roof of the furnace while the bottom of the pile may be another 100 degrees F lower than the top. The stack damper is then closed

Fig. 43—Modern batch annealing furnace installation showing annealing bases, cooling stations, charging car and furnaces. J & L photo



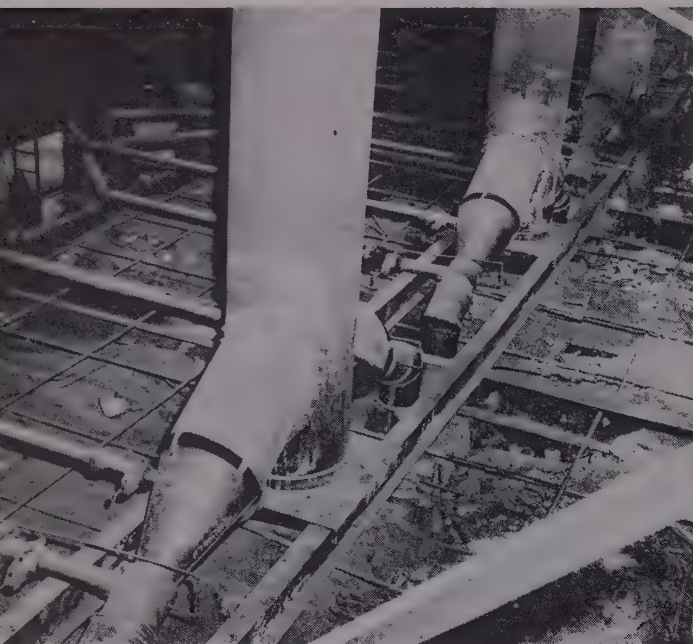


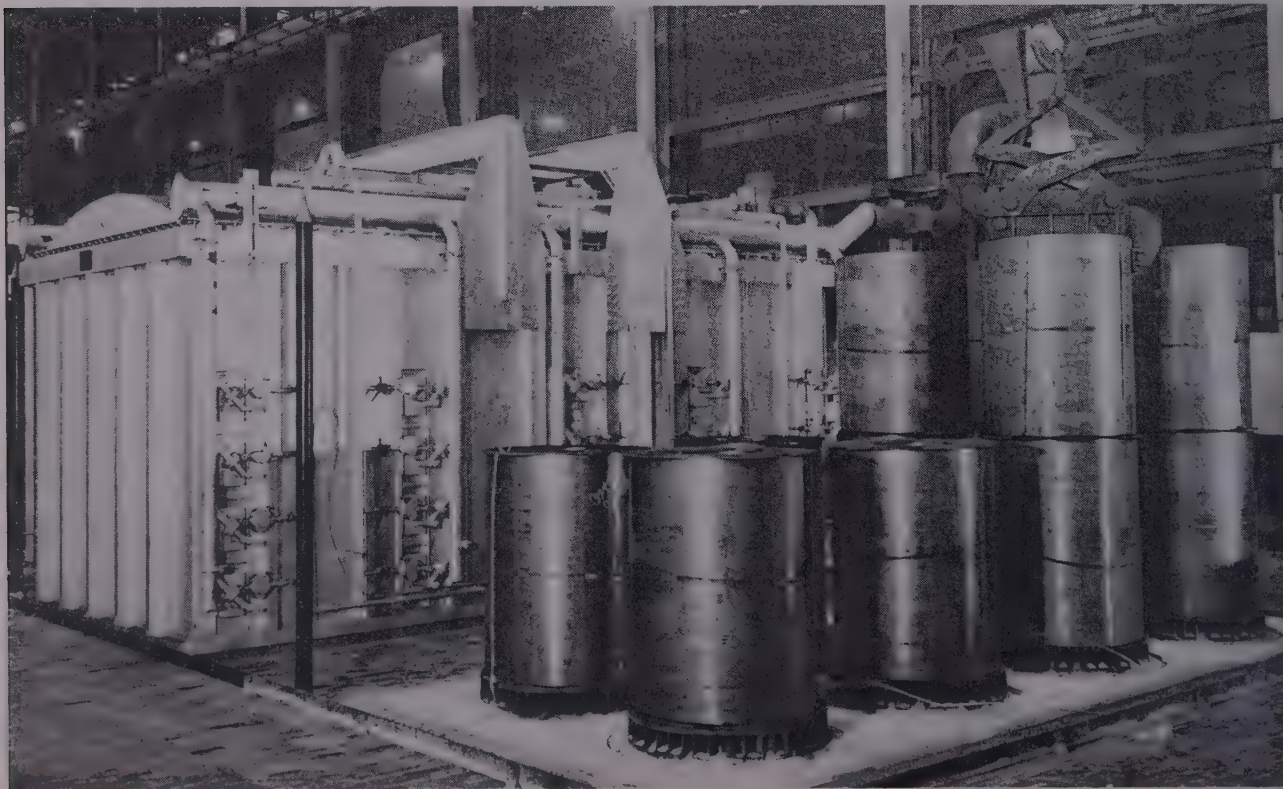
Fig. 44—Eductor installation on batch-type annealing furnaces. Furnace Engineers photo

and the top temperature held constant until the variation between the two points does not exceed 50 degrees F. This usually requires 30 to 40 hours on wide sheets and is called the soaking period, which period not only improves the uniformity of temperature of the pile but also improves the ultimate flatness of the sheet. The charge is withdrawn from the furnace at the end of the soaking period and allowed to cool to a temperature of about 300 degrees F after which the cover is removed and the pile of sheets exposed to room atmosphere for final cooling. During

the annealing operation and the subsequent cooling down to 300 degrees F, the box is filled with partially burned natural or coke oven gas under a few inches of water pressure. This deoxidizing gas is usually admitted to the box immediately upon being placed in the furnace and is permitted to flow through it to the atmosphere for some time, thereby purging the cover of air and rolling-oil vapors. When this practice is followed it is not necessary to clean the strip free of oil before annealing unless the product is to be coated with such metals as tin, nickel, chromium, or zinc, if the coating is to be deposited electrolytically. If proper purging and deoxidizing practices are not followed out, discolored or blackened edges may result from air infiltration and breaking down of the hydrocarbon from the residual rolling-oil.

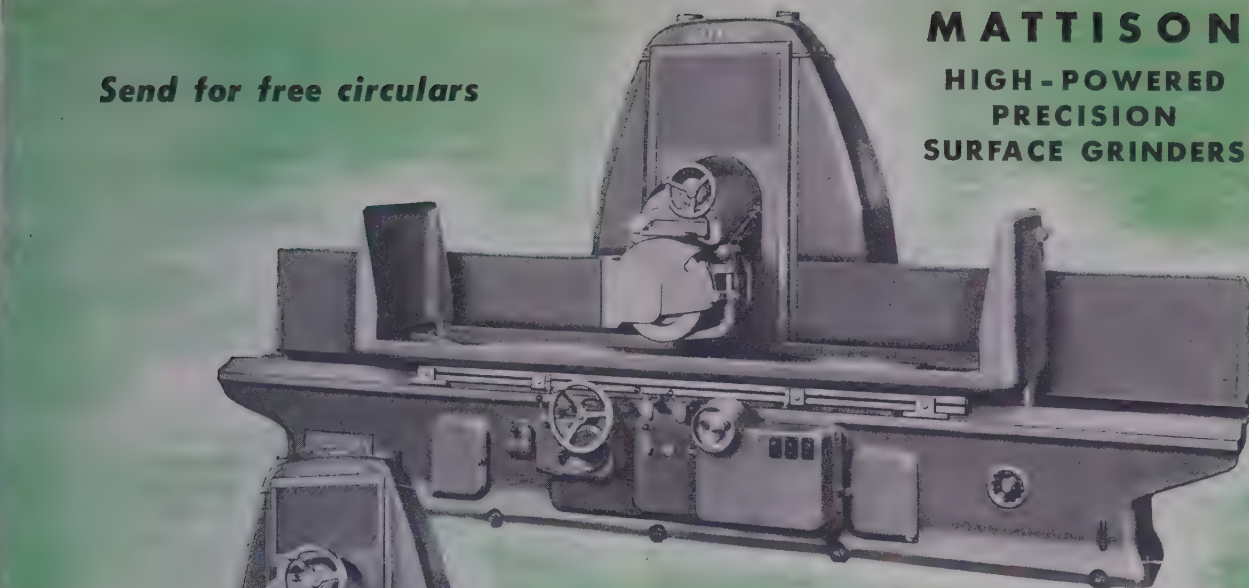
Furnaces of the type just described were originally rated at one ton per hour when using a piling height for sheets of about 50 inches and a total charge weight of 100 tons. Such a charge would consume about 100 hours furnace time when annealed at a temperature of 1300 degrees F. Two recent innovations have practically doubled the annealing rate of the conventional batch annealing furnace. The first improvement was the use of an oil upon the tandem mill which permitted the piling height to be increased from 50 to 72 inches without sticking the sheets. The second improvement consisted in the substitution of

Fig. 45—Modern radiant tube furnace for eight stacks of coils. Coils shown here weigh approximately 30,000 pounds each. Swindell Dressler photo



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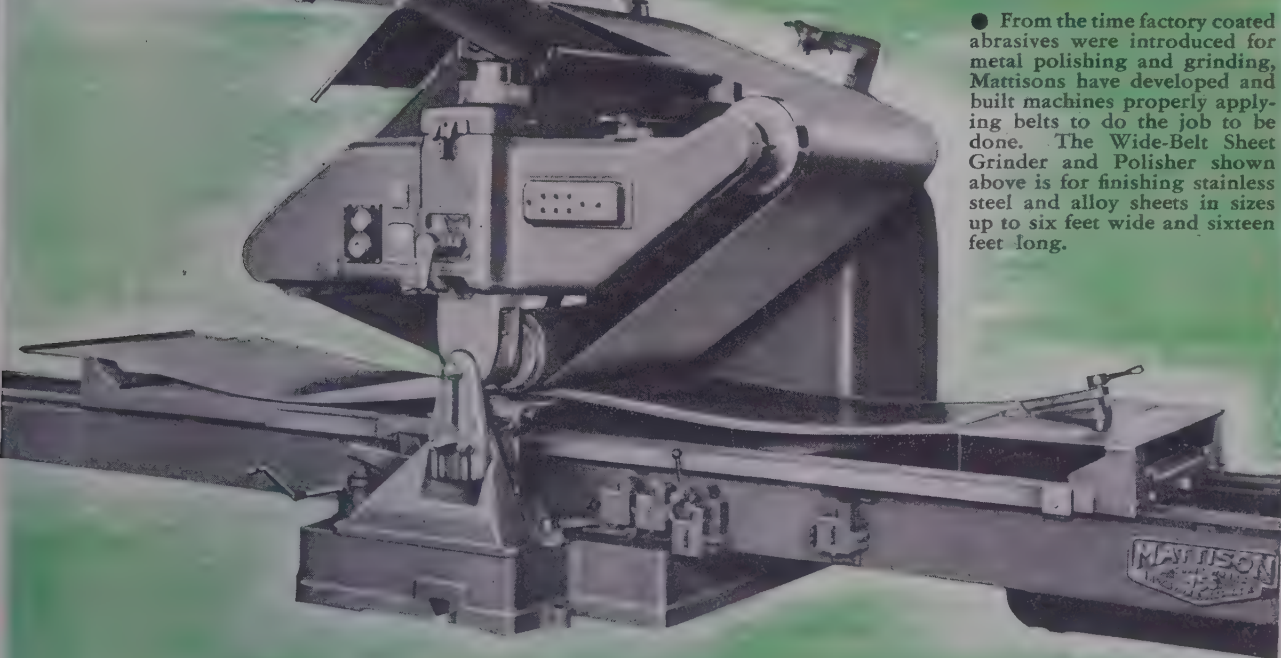
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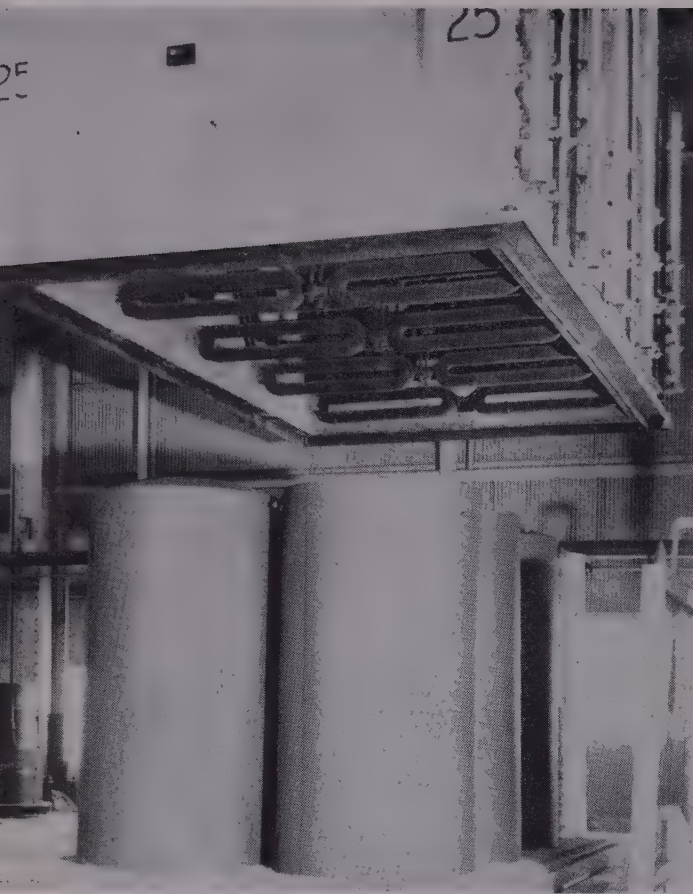


Fig. 46—View showing cylindrical covers and horizontal radiant tubes for coil type furnace. Swindell Dressler photo

an eductor, Fig. 44, for pulling products of combustion from the furnace roof to the waste gas flues under the annealing box, in place of the stack damper which had been used for decades to drive heat from the top of the charge to the bottom of it. Dampening the furnace usually resulted in incomplete furnace combustion and very smoky working conditions within the annealing building. Use of eductors has reduced the variation between top and bottom temperatures from 100 to 50 degrees F during heating

and has materially speeded-up the material's annealing operation.

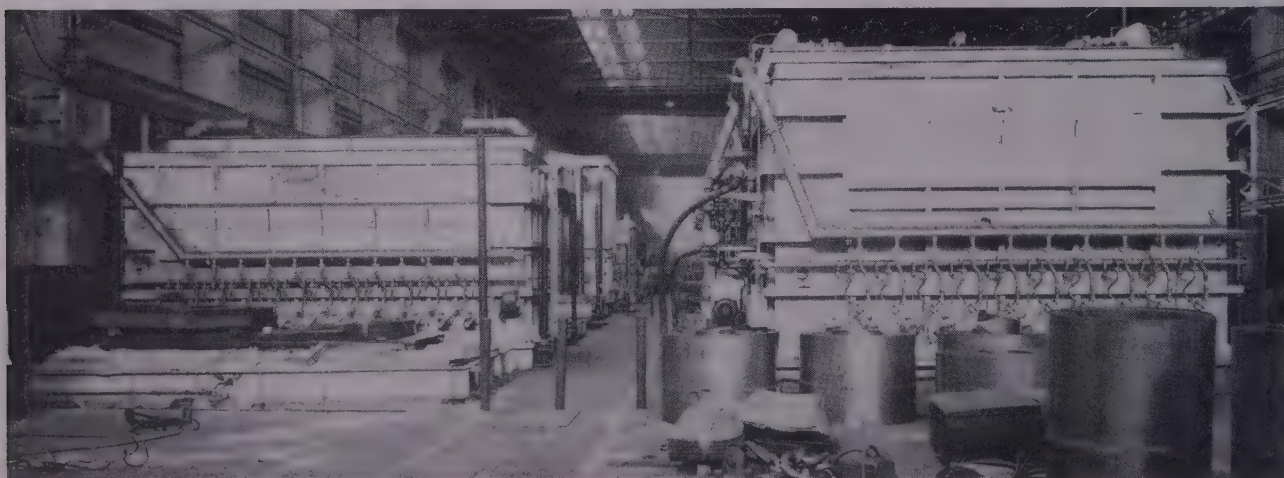
One disadvantage of the batch annealing furnace has been the weight of the base (30 net tons) which must be brought up to temperature on each charge of sheet or strip. Another disadvantage has been the difficulty of increasing output per furnace, thereby cutting down required floor space as well as operating labor. The third problem has been high fuel consumption. A major improvement in annealing practices started about 1930 and has resulted in the development of the gas-fired portable annealing furnace.

The portable furnace, as originally constructed, consisted of a brick lined cover with horizontal or vertical tubes, Fig. 46, and necessary fans and burners. Since combustion was carried out in the tubes which radiated their heat to the charge of coils or sheets, such a unit was called a radiant tube furnace. This furnace consisted of a steel shell lined with refractory insulating brick, the burner being mounted on the sides or ends and the heat-resistant alloy tubes were attached to the inside of the cover. Each furnace was provided with three structural steel, brick lined bases with sand seals and light weight steel inner covers. Quick acting connectors on fuel, electrical and pyrometer lines permitted rapid removal of the cover from base to base as the annealing cycle was completed.

In recent years, a new type of portable cover, Fig. 47, has been developed in which tubes have been eliminated and an eductor used for removing the waste gas from the furnace bottom. Increased annealing rates and lower fuel consumption has resulted when compared to the original radiant tube design. Improvement in fuel consumption has been offset somewhat by lower inner-cover life however this can be increased by spraying the outer surface with a molten heat-resistant alloy.

Early radiant-tube furnaces for coil annealing were sometimes equipped with fans for circulating hot gases within the inner cover. The fans were driven by motors of low horsepower rating and considerable trouble was experienced due to air infiltration

Fig. 47—Direct fired portable annealing furnace. Furnace Engineers photo



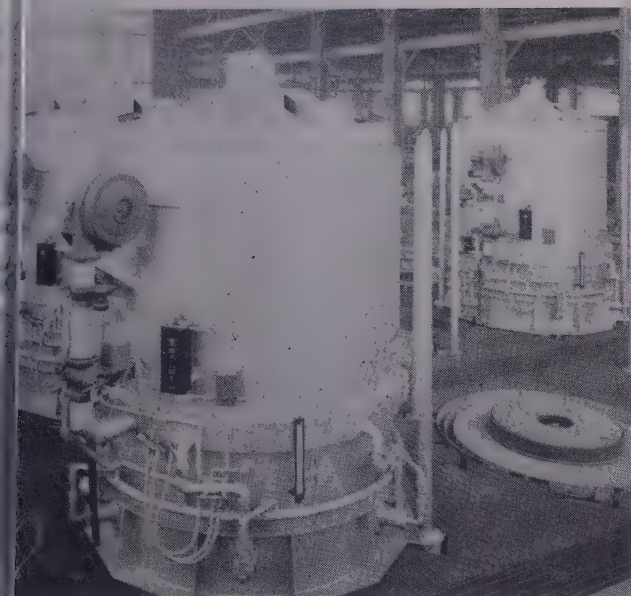


Fig. 48—Cylindrical type portable gas fired furnaces for narrow strip. Lee Wilson Engineering photo

around the fan shaft, resulting in sooty edges. Increasing furnace height, improving fan shaft seals and providing fan motors of from $7\frac{1}{2}$ to 15-horsepower has increased capacities of coil furnaces from $1\frac{1}{2}$ to $6\frac{1}{2}$ tons per hour on cold-rolled sheet product with-

out the necessity of any sacrifice in the hardness or ductility.

Portable annealing furnaces are frequently constructed with a cylindrical shell and treat a single pile of coiled sheets or strip on each base, utilizing gas or electricity as a heating medium. Such furnaces are called bell-type and are especially suited for narrow strip annealing, Fig. 48.

Batch annealing furnaces consume 1,500,000 Btu per net ton of product while modern radiant tube or direct-fired coil furnaces operate on a fuel rate of 1,000,000 Btu per net ton or less. If a blued sheet instead of a white or deoxidized sheet is desired, moist steam is admitted to the box when it is being cooled, no deoxidizing gas being used at any time.

Purpose of annealing is to render a sheet soft and ductile and present day equipment permits accomplishment of this task in a very successful manner when a hot band of suitable chemical composition, correctly hot-rolled and coiled on the hot mill, continuously pickled to give a clean surface and cold reduced the proper amount of reduction, is furnished. Annealing cannot correct the ills of previous improper processing, but if not controlled at every stage of the operation, can ruin what would have otherwise been a very satisfactory product. The best equipment obtainable and the most capable supervisors and operators are therefore needed for the successful operation of an annealing department.

(To be continued)

Air Conditioning Cuts Out Creep Test Compensations

Operating in an air conditioned room held at constant temperature is a battery of 20 creep testing machines installed at the research laboratory of National Tube Co., Pittsburgh. Installed in a compact bank complete with an auxiliary power supply, constant primary voltage control and complete instrumentation, the unit includes 18 lever type machines and two screw-driven machines.

To meet the special requirements of the laboratory, additional refinements were made in the machines, said to be of the most advanced design. Any machine in the battery may be removed for repair or adjustment at any time without exposing any wiring; all electrical connections to each machine are made through bayonet plugs fitting into flush sockets in the framework.

Three thermocouples are attached to a specimen under test at the quarter and mid points, enabling an accurate check to be made on the temperature of the specimen at any time. Provision has been made for shielding all thermocouple wires. Furnace temperature is controlled to within plus or minus 2° F by a sepa-

rate power control couple for each machine.

Furnace temperature records for the 18 lever type machines are maintained by three 6-point recorders which operate in conjunction with the controllers. Without the constantly maintained 70° F temperature in the room, variations in room temperature would require compensation and constant adjustments of instruments and control equipment.

Lever Type Machines Used

Lever type machines are used primarily for creep testing to predict the rate of stretch of specimens under load over long periods at elevated temperatures, usually 10,000 to 100,000 hours, or for creep-rupture testing where failure of the specimen is anticipated with 1000 hours. Machines are equipped with electronically controlled, motor driven extensometers which constantly follow the creep or stretch as it occurs in the specimen, recording the extension on mechanical counters.

Two screw driven machines, loaded through bar springs, are used primarily for short time (24-hour) creep-rupture and high temperature tensile tests. Both are equipped with specially designed autographic strain gages. All of the creep test furnaces are capable of being main-

tained at 1800° F for indefinite extended periods. One may be maintained at 2600° F.

Pressure Vessel Corrosion

Panel discussion on influence of nonferrous metals and their compounds on corrosion of pressure vessels, presented at the 51st annual meeting of the American Society for Testing Materials, is available in printed form from the society. Contained in the 45-page publication, available for \$1.00 each, are papers on: Station design and material composition as factors in boiler corrosion; and corrosion of high-pressure steam generators: status of our knowledge of the effect of copper and iron oxide deposits in steam generating tubes.

—o—

Only five working days were missed in six and one-half years of handling 20,000 cars per year, by a General Electric 45-ton diesel-electric switching locomotive on the Alabama, Tennessee & Northern Railroad. During this time, in which the unit operated an average of 2400 hours per year, expenses are said to have averaged only 31 cents per hour for fuel and maintenance material costs.

MANUAL HIDDEN ARC WELDING

... applied advantageously to general manufacturing operations

By W. R. PERSONS
Lincoln Electric Co.
Cleveland

MANUAL hidden arc welding equipment has been available for general application to manufacturing operations for a little over a year. Uses to which this equipment has been put during the past year well demonstrates one of the principal features of its design, namely, flexibility. The advantages of hidden arc welding have been brought to jobs which, either because of their shape or the quantity in which they were made, were not previously practical applications for the process.

Results of the imaginative application of this welding method to a wide variety of products are reduced manufacturing costs, coupled with improved product performance. The use of the process in conjunction with a power-driven turntable is illustrated by a job done at Washington Iron Works, Seattle. The weldment is a gear case weighing 400 pounds and is used to transmit as high as 310 hp at 1200 rpm. The case was designed originally for a weldment and

is made chiefly of $\frac{3}{8}$ -inch and $\frac{1}{2}$ -inch steel plate. Fig. 2 shows the weldment tack welded and ready for final welding.

Welding is done with the manual hidden arc in 25 per cent of the time formerly required. In addition to this saving of 75 per cent in the welding time, the appearance of the weldment is improved and there is less tendency for distortion.

Another example of how different types of welds can be made is the welding of a drier roll used in a pulp mill. These rolls are made by the Willamette Iron and Steel Co., Portland, Oreg. The units must meet boiler code specifications for pressure vessels operating at 50 pounds steam pressure.

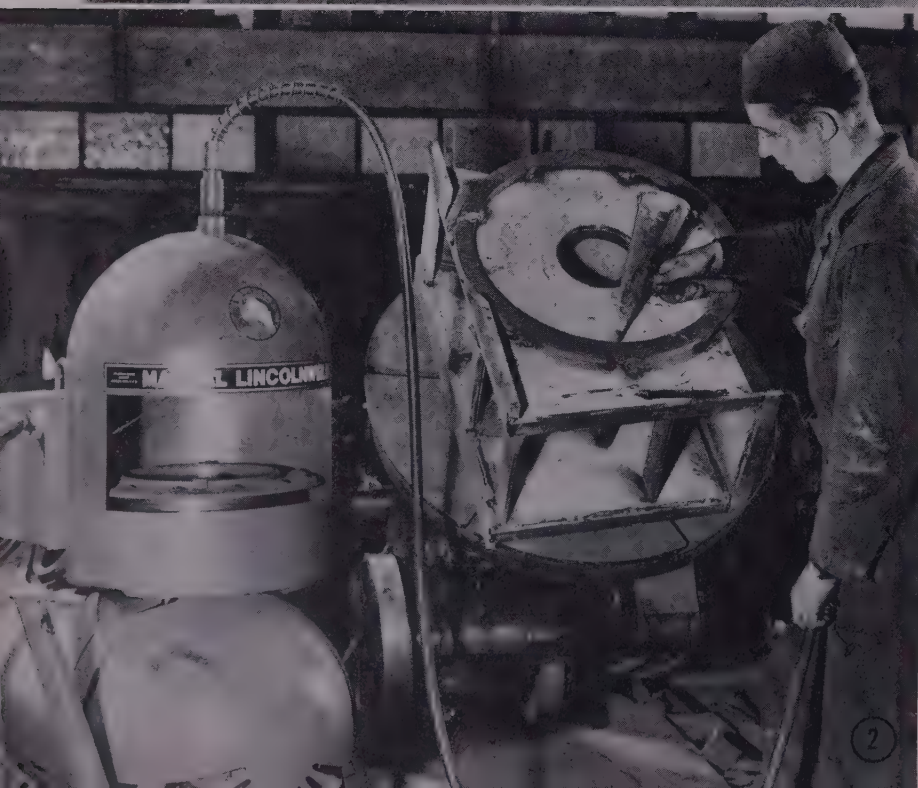
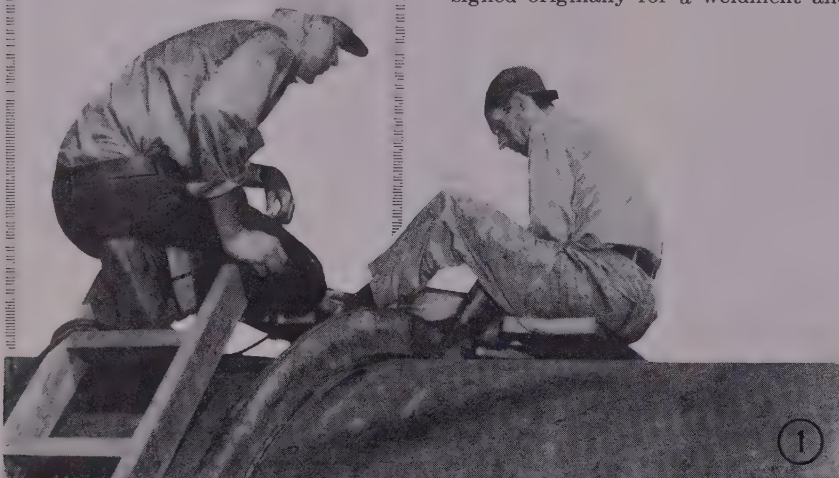
The roll is 8 feet 6 inches long, 36 inches in diameter. Shell is $\frac{1}{2}$ -inch plate, the head $\frac{3}{4}$ -inch plate, with web reinforcements of 1-inch plate on either end. Shaft diameter is $7\frac{1}{2}$ inches. All the welds on this roll are made by manual hidden arc weldings.

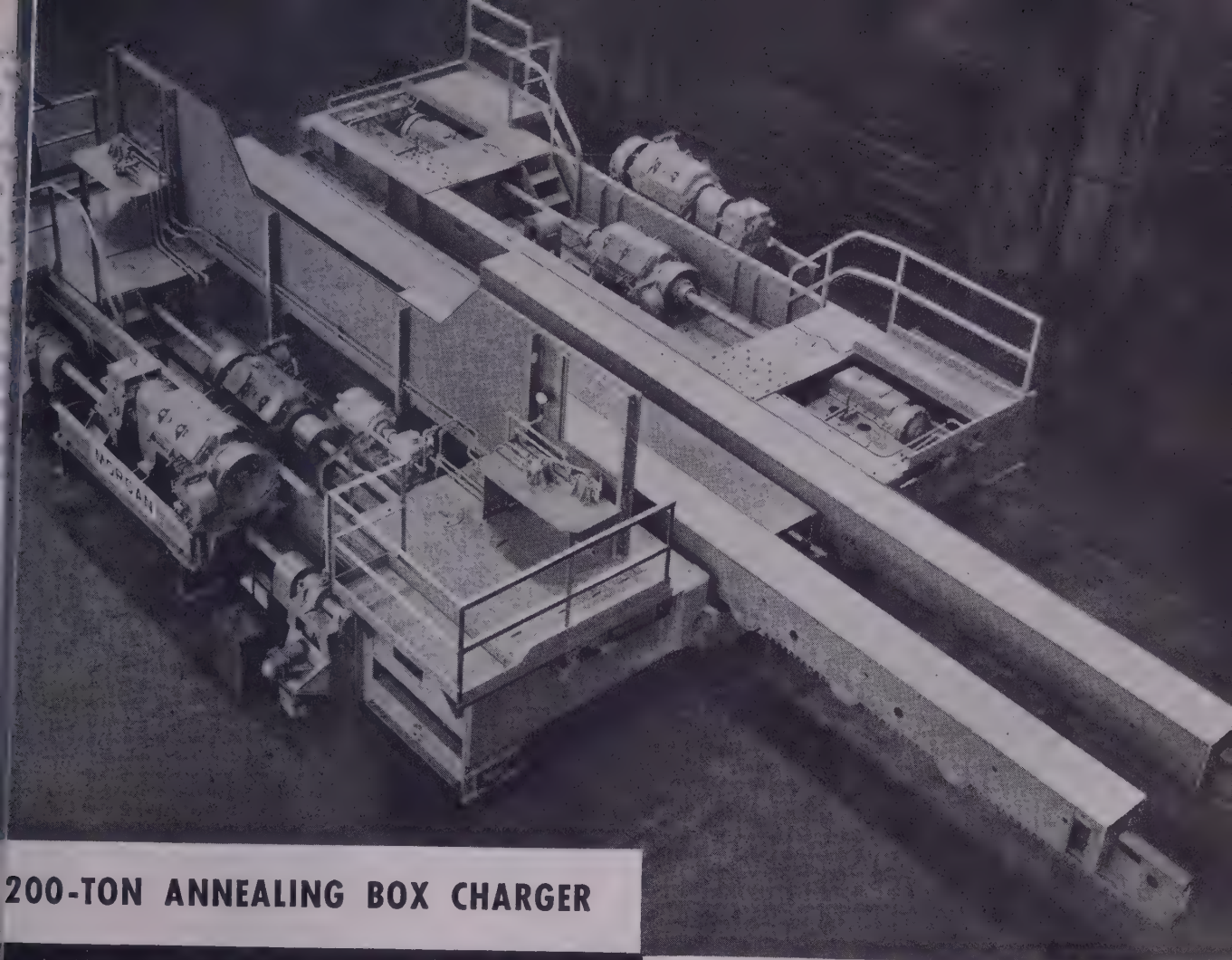
Longitudinal seams on the $\frac{1}{2}$ -inch shell were made both inside and outside by mounting the welding gun on a cutting torch tractor and traveling at the rate of 18 inches per minute. Fillet weld on the head is accomplished by setting the shell on a 45-degree angle, mounting the bottom on an idler roll and turning the shell so that it feeds under the arc at the rate of 22 inches per minute. Web stiffeners were welded prior to mounting the head in the shell. These welds are made by simply moving the welding gun along the joint by hand.

Darby Corp., Kansas City, Mo., uses a unit both inside the shop and in their fabricating yard. Fig. 1 shows reinforcing rings being welded on 6-foot diameter penstock. These rings are $\frac{5}{8}$ x 5 inches welded to a $7/16$ -inch thick shell spaced 8 feet apart. Specifications call for a full $\frac{1}{4}$ -inch fillet weld on each side. The rings are first tack welded and then rotated by power-driven rollers so that the joint moves continuously past the operator holding the welding gun. The helper keeps the gun full of flux

Fig. 1 — Welding reinforcing rings on 6-foot penstock. Welding is continuous as rolls drive penstock and helper keeps gun full of flux. Three hundred fifty-two feet of $\frac{1}{4}$ -inch fillet weld is made in 8 hours

Fig. 2—Gear case ready for welding on a power-driven positioner. Work is moved under the welding gun held in the operator's hand





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Illustrated is a Morgan 200-Ton, 5-motor, 19'-3½" Span Annealing Box Charger. It consists of a traveling bridge upon which are mounted two rack driven charging trucks operating in unison for raising the annealing boxes and moving them into or out of the furnace or onto the cooling beds. The charging trucks are operated by two motors through four worm units with provision for operating either of the two motors alone.

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and handles other necessary welding details.

Speed of welding is 22 inches per minute, using approximately 360 amperes. The dense, smooth fillet weld can be seen in Fig. 1. Three hundred fifty-two feet of fillet weld are deposited in an 8-hour shift.

An unusual application is being made by the McNally Pittsburg Mfg. Corp., Pittsburg, Kans. A 12-foot trunnion wheel for a rotary coal crusher is welded with the manual unit, realizing a saving of approximately 25 per cent over regular hand welding.

The wheel is made by welding an 8 x 3-inch bar to a 1-inch web. The $\frac{5}{8}$ -inch fillet weld is made in three passes, welding on each side of the wheel. No scarfing is necessary to prepare the joint. The welding gun is mounted on a cutting torch which is run continuously around the seam as illustrated in Fig. 3. The weld is made at a speed of 16 inches per

minute, without stopping, using approximately 400 amp. High current density resulting from the use of high amperage with the $\frac{5}{64}$ -inch diameter welding wire secures deep penetration on all welds made with this unit.

Two other typical applications of manual hidden arc welding are seen in the work the Balderson Mfg. Co. does in making snowplows and small bulldozers in Wamego, Kans. The bulldozer frame yoke is a box section which is made by welding two angles together. The 6 x 6 x $\frac{5}{8}$ -inch angles are welded in lengths of 20 feet with continuous welds on each side. Angles are simply clamped together and welded at a speed of 24 inches per minute. In addition to being much faster, the hidden arc welding also minimizes distortion because of the uniform application of heat.

Small roundabout welds are made in welding pivot hinges, which are

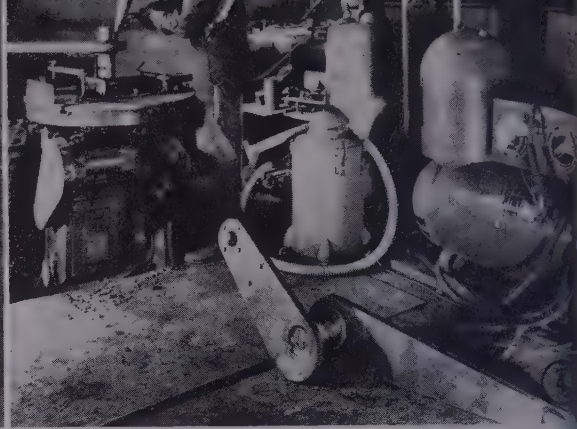


Fig. 3 — A 12-foot trunnion wheel for coal crusher. Three passes are made continuously to make a $\frac{5}{8}$ -inch fillet weld. No edge preparation is necessary

Fig. 4—Example of roundabout welds made holding work stationary and moving the welding gun. This is a tilting arm for an industrial lift truck. Arms are 1.2-inch plate welded to 4-inch diameter shaft

hinges for the frame yoke. These small $3\frac{1}{2}$ -inch diameter high carbon steel pins are loaded heavily in the structure. In welding, the work is clamped stationary to a table and the gun moved around the seam to make the weld. Maximum penetration in one pass is secured and the tendency to underbead cracking previously encountered is eliminated. Savings of 50 per cent have been realized on this one part.

States Quality Control Can Save Industry Money

Quality control and preventive inspection programs can save American industry more than \$3 billion a year, according to J. J. Manuele, director of quality control for Westinghouse Electric Corp., Pittsburgh. He stated that while an inspection department assures adequate product quality for the consumer, it does not protect the manufacturer against the loss that results from defective production.

Mr. Manuele suggested a five-point program, including: (1) Clearly defined standards of quality; (2) sufficient inspection coverage; (3) proper inspection methods; (4) correct inspection tools; and (5) maintenance of adequate records. He went on to say that adequate quality control, even on such operations as automatic screw machines, has increased production as much as 30 to 35 per cent. When applied to an

entire plant, the program reportedly has made possible reductions in inspection costs by as much as 50 per cent, at the same time cutting the cost of scrapping or re-operating substandard parts by 75 per cent.

Foam System Extinguishes Solvent Fires Quickly

Solvent fires may be extinguished in less than 3 minutes with little possibility of re-ignition with a new method of fire protection in plants using such solvents as benzene and gasoline. Such a system was recently installed in the Brunswick, Ga., naval stores plant of Hercules Powder Co., whose technicians collaborated with National Foam Systems Inc. engineers. A system was devised by the Philadelphia company using floor or marine nozzles and Aer-o-foam liquid, which covers the floor of each protected area with a foam blanket at least 6 inches deep within 3 minutes or less.

One man by operating a few switches, can arrange for the discharge of foam from all outlets of the fixed foam systems within about 1 minute from the start of a fire. Installation was made on the basis that if fires should occur, those of greatest severity would be at the ground or floor level from a spill of benzene, gasoline or other solvent. Therefore foam applicators were placed 9 to 12 inches from the floor.

To help build up the required depth of foam, concrete curbs 6 inches high have been installed around the perimeters of every floor equipped with the foam system. Thus, if a flammable liquid spill occurs, it is retained within the curb and the foam blanket applied immediately on top of the flaming spill effectively smothers the fire, the company states. It is reported that 6600 gallons per minute of water foam solution can be delivered to the three foam-protected buildings. This is said to produce 66,000 gallons of foam per minute.

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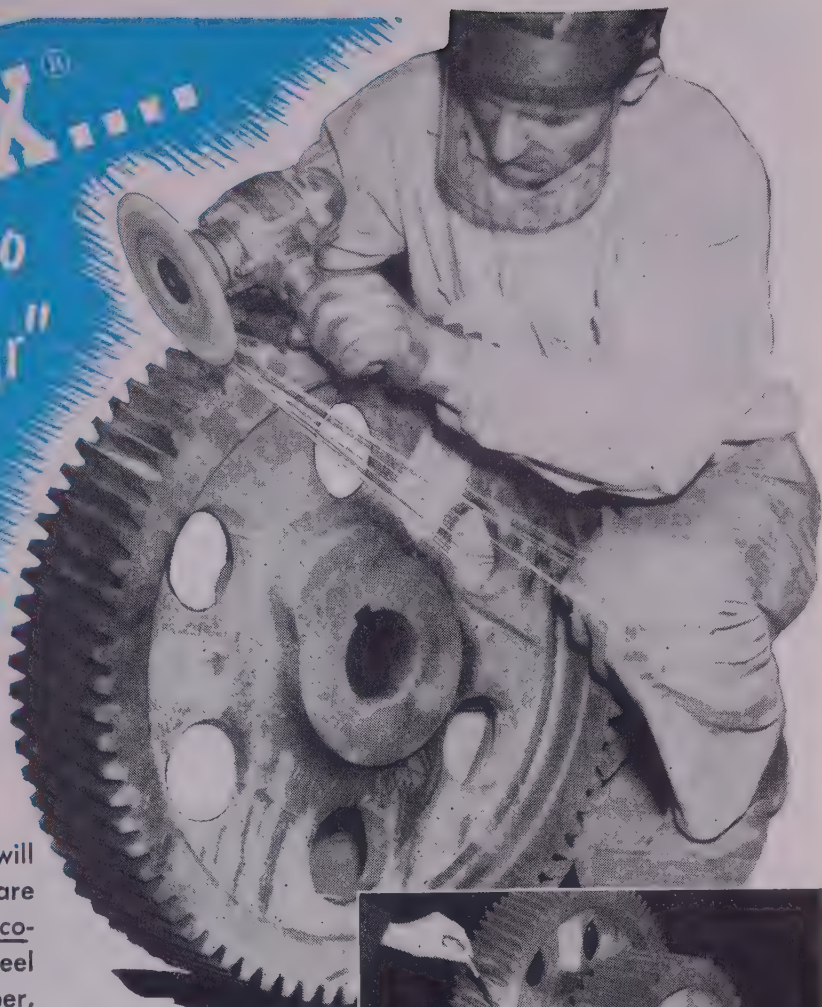
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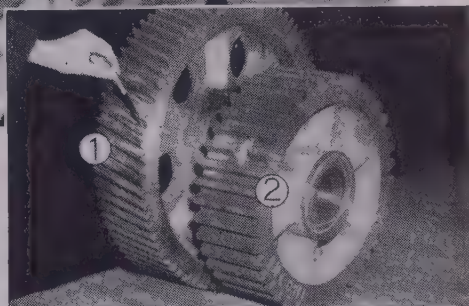
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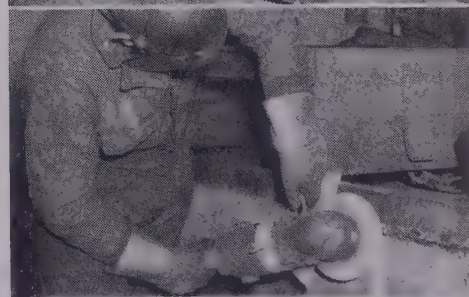
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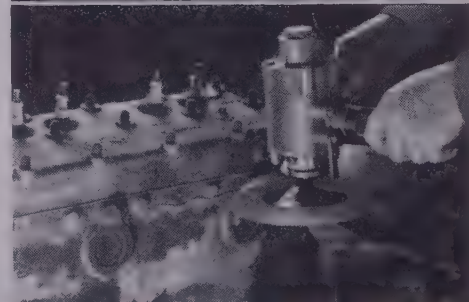
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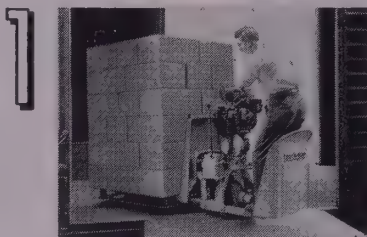
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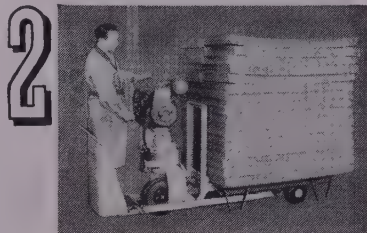
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Testing Facilities

(Continued from Page 66)

located behind the scale dial. A light source in front of the dial shines on the cell through a slit in the dial face. One of the scales has three paddles, and the others, four, firmly fastened to the pointer shaft of the scale. They are fastened in different positions on the shaft, so that they occupy different positions on the scale dial.

As the weigh tank fills up and the shaft begins to turn, the paddles move around the dial towards the location of the photoelectric cell. Weight which will cause a given paddle to move far enough around the dial to interrupt the beam of light to the cell, is, of course, the difference in weight reading between the location of the cell and the location of the paddle when the weigh tank is empty.

As the paddles move around the scale dial when the weight tank is filling, each paddle passes and interrupts the beam of light to the photoelectric cell, causing an "impulse" in the cell circuit. Also in this circuit, located in the control room, is an impulse counter, which is the device which actuates the test control circuits. This counter can be set manually to trip on any of the impulses it counts, thus effectively giving the operator a choice of the test weights represented by the various paddles on the scale.

Control Room—Nerve center of the test floor is the control room, from which all operations in the testing of a pump, except the setting of the discharge pressure, are carried out. The room consists of two control cubicles, separated by a transfer panel.

Each cubicle contains a recording speed meter, a recording torque meter, a recording 30-foot suction gage, and recording gages of 150 feet, 250 and 500 feet pressure range. Each pressure gage has a sight flow glass for checking the existence of air bubbles in the gage line, and a self-sealing coupling plug for plugging in dead weight gage testers or manometers for testing the gage.

On the transfer panel is a test weight selector, a "start test" button, an "emergency test stop" button, and a "tank empty" indicator lamp for each of the three weight tanks, a timer for each cubicle, switches for selection of the proper motor speed generator disk for each test stand, and switches for transferring the torque pickup and speed generator connections from any of the three test stands to either of the two test panel sets of recording meters.





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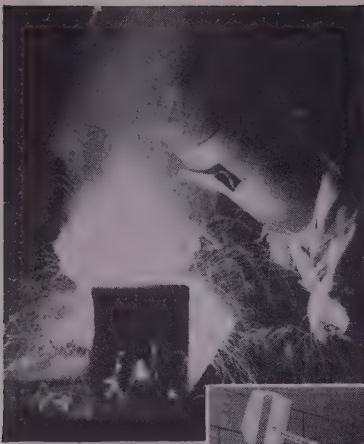


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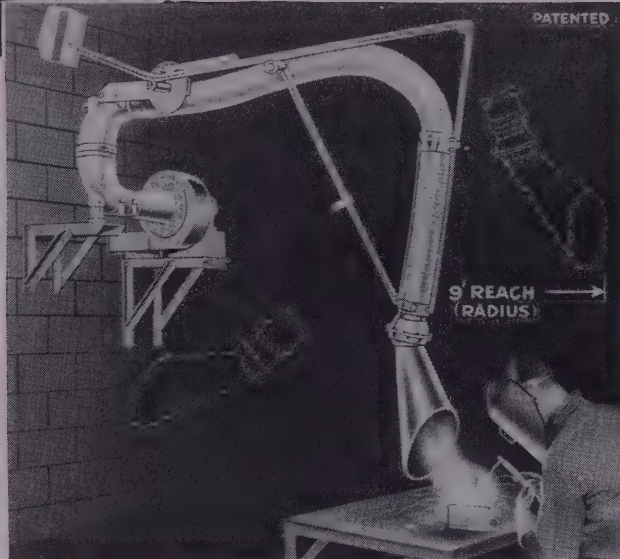
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Connection between the gages of either of the test panels and the connections at any of the three test stands, is made through self-sealing couplings located on the outside of the control room.

How Data Are Obtained—The usual commercial test of a pump on the new Allis-Chalmers test floor consists of making a series of short test runs, each made at a different discharge pressure, during which a predetermined amount of water is pumped in a carefully measured period of time. During each run, pump suction and discharge pressure, torque input to pump and pump speed are continuously measured and recorded on automatic recording meters. Each of these runs provides data from which a point can be plotted against discharge in gallons per minute for each of three curves: Pump horsepower, efficiency, and total head. Usually, six to eight points are taken, at pressures ranging from cutoff (valve in discharge line entirely closed) to well beyond the rated conditions of the pump, often up to breakoff (point at which pump will no longer lift water). An entire pump test, including recording data, calculations and plotting curves, seldom requires more than 20 minutes.

Pump Capacity—Water discharged from a pump being run on a test stand is piped into a weigh tank fitted with three normally-open, air-operated dump valves in its bottom. When a test point is to be taken, the operator closes these valves by pushing a button in the control room. When the predetermined amount of water has been pumped, the valves open automatically to empty the weigh tank into the storage tank beneath the floor. A timing device, reading in thousandths of a minute, starts and stops automatically at the beginning and end of the test period. Thus, by dividing the known amount of water pumped by the fraction of a minute required to pump it, the discharge in gallons per minute can be determined.

Horsepower required by the pump during a test is calculated as the product of the pump speed and the torque input into the pump. Pickups for the torque and speed measuring devices are mounted in their own bearings on a special shaft assembly, with half-couplings at each end for connection between the motor and the pump on a test stand.

Torque measurement utilizes the Baldwin type T torque pickup. The special alloy steel shaft in this unit carries the full torque between motor and pump. Torque is found by measuring the twist in the shaft by means

A 5580-2/3A



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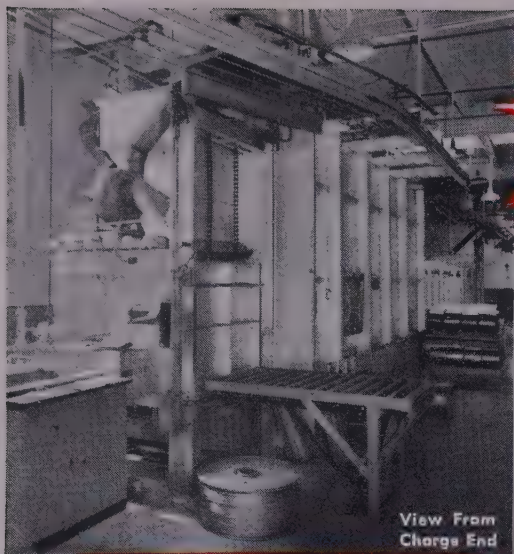
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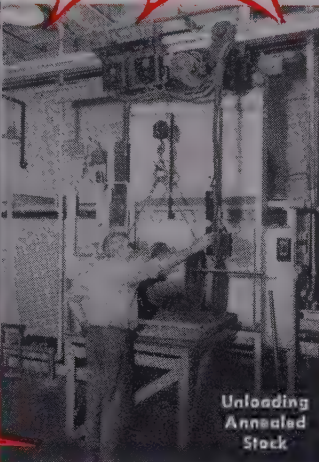
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of a Baldwin SR-4 electric resistance strain gage. Output of the torque pickup is registered on a recording meter that is located in the control room.

Speed measuring device was developed especially for this application by Allis-Chalmers electronic engineers, and is believed to be the most accurate device of its type ever built. Essentially, it operates by comparing the frequency of a generator driven by the test motor to a standard known frequency, generated by a tuning fork, measuring the difference between these frequencies.

Five different speeds are used in testing pumps on the new test floor, obtained with induction motors having synchronous speeds of 600, 900, 1200, 1800, and 3600 rpm. Since the desired accuracy of speed measurement could not be obtained in a device which would have to measure a range of frequencies as wide as this range of speeds, the speed generator on each test stand consists of five separate frequency generating units, one for each speed.

Each unit consists of a steel disk mounted on the shaft of the torque-speed pickup unit between the motor and the pump. The disk is not circular, but has a number of humps on its circumference. It is these humps, as they pass between the elements of the poles, which cause the induction of a rising and falling current in the pole windings. One disk has 18 humps, so that when the pump is being driven by a 600 rpm motor, it will cause a current varying between 170 and 180 cycles per second to be induced, as the motor varies between no-load and full-load speed.

A second disk has 12 humps, so that the variation between no-load and full-load speed of a 900 rpm motor will cause generation of a frequency between 170 and 180 cycles. The third disk will generate between 170 and 180 cycles, when driven by a 1200 rpm motor; the fourth will generate in the same range with an 1800 rpm motor, and the fifth generates between 170 and 180 cycles when driven by a 3600 rpm motor.

Thus regardless of the speed of the test motor being used, a selector switch permits the operator to see that frequency in the same range, between 170 and 180 cycles, is being fed into the measuring device. This frequency is then set against a constant 150 cycle frequency from a tuning fork, and the difference is measured by an Esterline-Angus 20-30 cycle continuous recording frequency meter. Thus, by narrowing the range of measurement down to a variation of only 10 cycles, it is possible

THE JOINTS STAY TIGHT WHEN YOU

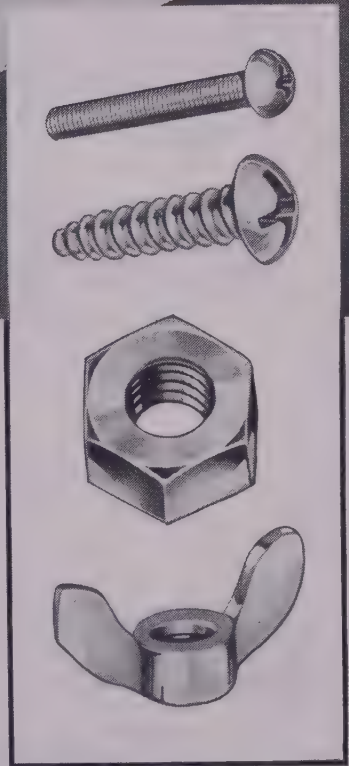


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to read the motor speed accurately to within less than 1 rpm.

Pressure — Suction and discharge pressure measurements are made by Esterline-Angus continuous recording gages, mounted in the control room. Lines from these gages run to a panel on the outside of the control room. Connections to self-sealing couplings on the discharge and suction side of pumps are made through flexible hoses connected to copper tubing running under the floor from the control room to the test stations. These hoses are plugged into the pump connections, and to the desired gage connections at the control room, by means of Hansen self-sealing valves. Suction gages have a scale of 0-30 feet, while three ranges of discharge pressure gages are available: 0-50, 0-100, and 0-500 feet.

Taking a Test Point—Assume that a pump is set up on test stand "B" and is running, water flowing through the discharge pipe and spout into the weigh tank, and out through the valves in the bottom of the tank. The first step in making a test run is to set the discharge pressure of the pump to the value desired for the test point to be taken. This is done by adjustment of the valve in the discharge pipe from the pump.

Now the operator pushes the "start test" button on the control panel. This closes the valves on the bottom of the weigh tank, which then begins to fill. As the tank fills, the paddles begin to move around the scale dial. As the first paddle reaches the cell and interrupts the beam of light, the impulse will cause the impulse counter to actuate the control circuits, starting the test timer, and shifting the recording meter and gage drives to test speed.

Assuming the operator has selected test weight "2" by setting the impulse counter knob "2", the first impulse after the test has begun, caused by the interruption of the light beam by the second paddle on the scale, will have no effect. But as the third paddle reaches and interrupts the light beam, this second impulse after starting the test will trip the control system, stopping the timer, shifting the chart drives to low speed, and opening the dump valves to empty the weigh tank. A green light glows on the control panel when the tank is empty, informing the operator that he can then set a new discharge pressure and proceed to make another test run.

If, on the run just taken, the timer stopped at 0.585 minutes, and the

operator knows that the test weight he selected was equal to 300 gallons of water, he looks up the pump capacity on a chart and determines the rate of 512 gallons per minute. He can refer to the charts traced during this 0.585 minutes to determine what the pump speed, torque, a suction and discharge pressure were. From the suction and discharge pressures, he calculates the total head. From the torque and speed readings, the horsepower used by the pump pumping 512 gallons per minute against this head is found. From the total head and the weight of water pumped, the pump output in terms of horsepower can be found and divided by the horsepower input to determine the efficiency of the pump.

Since the motor speed will probably be a few revolutions per minute off the rated pump speed, charts and tables are used to correct readings at rated speed before they are plotted. Each run such as the one just described produces a point for each of the three curves: Pump horsepower, pump efficiency, and total head—plotted against gallons per minute. The taking of enough points for a curve, calculations and plotting can be completed in a very short time.

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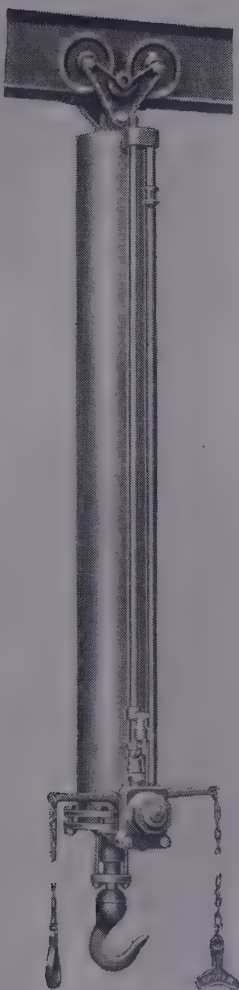
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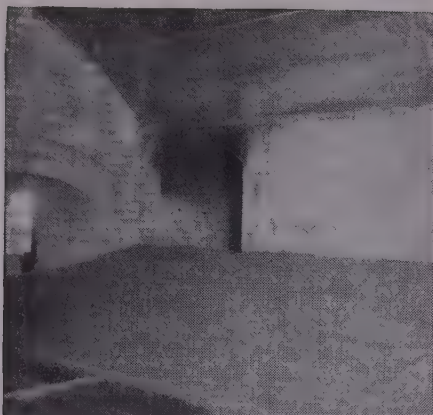
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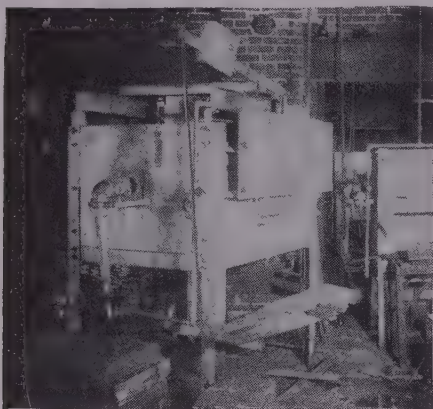
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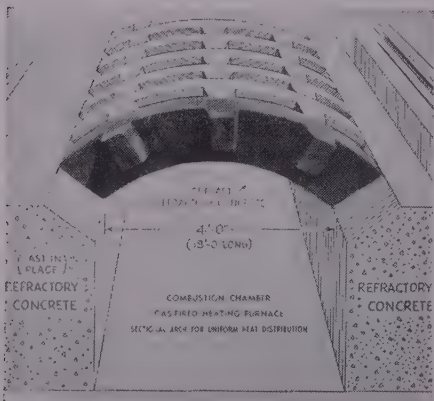
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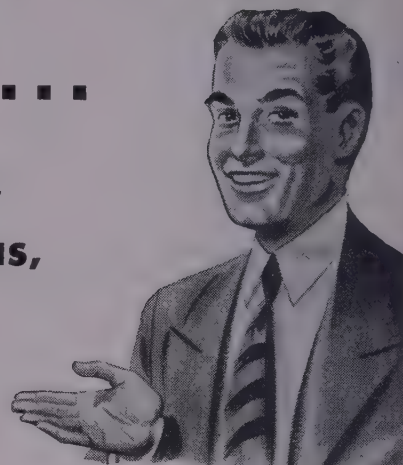
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Castables to meet different temperature and insulation requirements are made by manufacturers of refractories and sold by their distributors. For further information, write to LUMNITE DIVISION, Universal Atlas Cement Co. (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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Monday Evenings—June to September

STEEL

fact, the half hour usually consumed in a pump test is due to the need for assurance that the pump is in satisfactory mechanical operating condition, rather than for the test process itself.

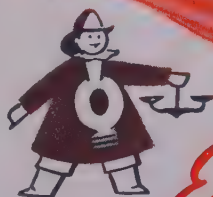
The various chart drives on the recording meters and gages are all accurately synchronized, permitting readings at corresponding points on each chart for accuracy in the event there is a more than negligible variation in any of the recorded quantities during the test period.

Testing Larger Pumps — Certain types of multistage pumps are too large in physical size and horsepower requirements to enable mounting them on one of the three permanent test stands, yet their discharge volumes are within the capacity of the weighing equipment. These pumps are set up on the floor between test stands B and C, in front of the control room, since the numbers of such pumps to be tested do not justify construction of a test stand large enough for them. Their discharge is piped to the weigh tank of test stand B. A torque pickup and speed generator assembly is being made for use with such pumps, the leads from which will plug into sockets in the front of the control room, and will be led to transfer switches marked "test stand D" inside the control room.

Condensate pumps are a special class of equipment, required to remove liquid from a space in which the pressure is extremely low. Instead of the pump being tested taking suction from the storage tanks beneath the floor, suction is taken from a "dummy condenser." This condenser is a large tank containing perforated plates, through which water from the storage tanks is pumped. Steam air ejectors are used to maintain the vacuum in the condenser, corresponding to the temperature of the water pumped.

—O—

Polishing, grinding and other machining operations of a similar nature reportedly are greatly speeded by a new application of the collet chuck made by Erickson Tools Division, Cleveland, O. A spring-actuated, cam-release setup, the operator merely feeds and unloads the machine. Eight chucks are mounted in a multiple-spindle head, the chucking and release being fully automatic. A cam releases spring tension on each chuck as it comes in to unload and feed positions. Collapse brings entire surface of collet into contact with stock. Run out and slippage are said to be eliminated.



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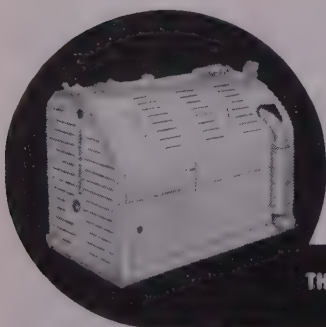
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Ductile cast iron, a new engineering material (STEEL, Apr. 4, 1941, p. 124) developed by International Nickel Co., New York, is now being produced by numerous foundries throughout the United States. Some of the companies licensed under pending patent applications to produce this new material are:

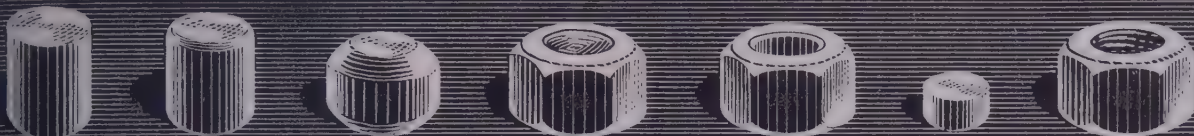
Albion Malleable Iron Co., Albion, Mich.
Anstice Co. Inc., Rochester, N. Y.
Atlas Foundry Co., Irvington, N. J.
Benton Harbor Malleable Industries, Benton Harbor, Mich.
Bison Castings Inc., Buffalo, N. Y.
Chambersburg Engineering Co., Chambersburg, Pa.
Cooper-Bessemer Corp., Grove City, Pa.
Dostal-PerMold Foundry Co., Pontiac, Mich.
Francis & Nygren Foundry Co., Chicago, Ill.
Kutztown Foundry & Machine Co., Kutztown, Pa.
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James Spence Iron Foundry, Jersey City, N. J.
Sterling Foundry Co., Wellington, O.
Straight Line Foundry & Machine Co., Syracuse, N. Y.
Texas Foundries Inc., Lufkin, Tex.
Treadwell Engineering Co., Easton, Pa.
Youngstown Foundry & Machine Co., Youngstown, O.

New material combines process advantages of gray cast iron, such as fluidity, castability and machinability, with product advantages of cast steel. It is characterized by a graphite structure in form of spheroids. Its mechanical properties, particularly high elastic modulus, high yield strength and ductility, have suggested many potential applications for this ductile cast iron in various industries.

Injury Prevention Should Be Part of All Operations

Keystone of accident control is that every employer should include the prevention of work injuries as an integral part of all operations, stated the co-ordinating committee of the President's Conference on Industrial Safety, recently held in Washington, D. C. The report of this committee went on to say that an organized safety program is required which will include continuing executive direction, definite assignment of responsibility, effective engineering controls, adequate safety education, employee co-operation and accident records to show sources, causes, trends and costs.

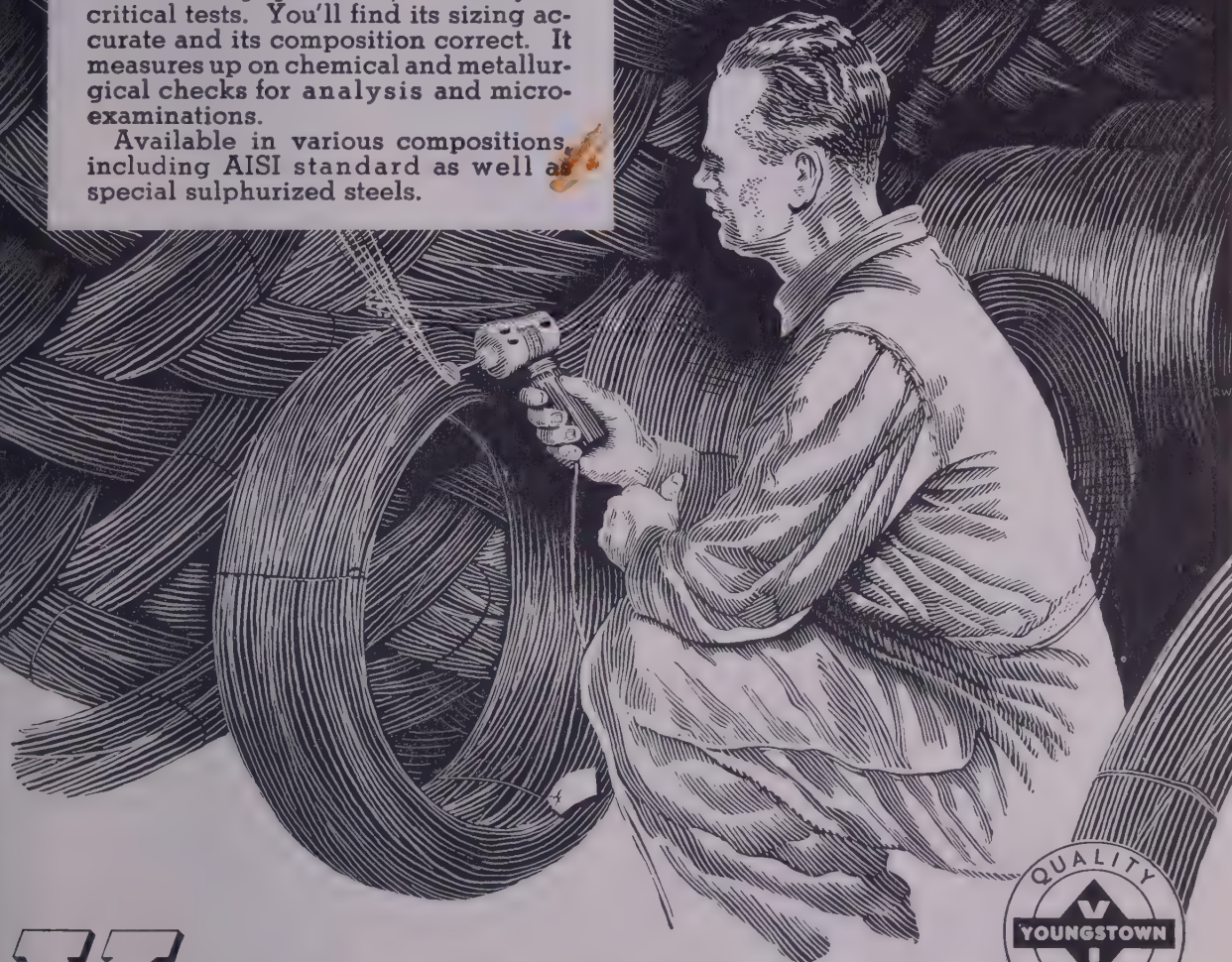
It was pointed out that over 20 million job accidents cost employees and employers an estimated \$4.5 billion yearly. In the 40 years since the establishment of the industrial safety movement, some industries have little or no progress in the reduction of accidents. In manufacturing, the in-



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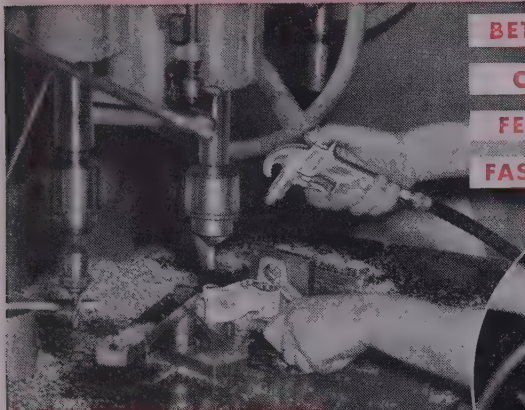
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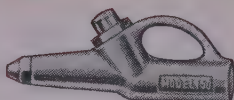
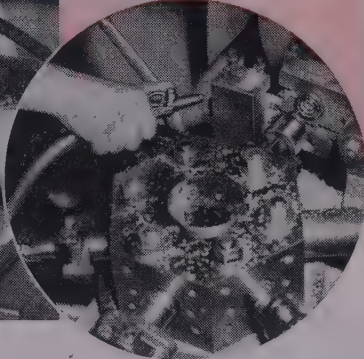


BETTER MACHINING

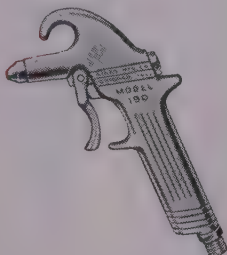
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The rugged little Binks Model 150 is built to take all the knocks it will get as industry's favorite blow gun. It's made of solid brass, to fit the hand. The simple non-pinch air valve can be operated from any position.



Then there is Binks Model 190 dusting gun that has many important industrial uses for dusting as well as drying surfaces before spraying. Made with a comfortable pistol grip and trigger-operated; all-aluminum construction.

Blow guns are inexpensive aids to better production . . . cheap and effective insurance against disabling hand injuries and infection. They're mighty useful just for cleaning machines alone; they save operators' time, keep the work clean and prevent probable rejects. Indispensable for blowing chips from jigs and fixtures in drilling, facing and counterboring operations.

A blow gun at every assembly and inspection bench blows dirt and chips from holes and recesses . . . saves time and adds life to valuable gauges. Tool cribs find them mighty useful too.

You can use a lot of blow guns . . . there's a place for them on every machine tool . . . for scores of time-saving uses in every corner of factory or foundry and along assembly lines.

Both Models 150 and 190 are available with 1/16, 5/64 or 3/32 inch orifices to use 3½, 5 or 8½ c.f.m. on high- or low-pressure air lines. Six-inch nozzle extensions can be had, which greatly multiply the usefulness of both models. The complete Binks line of spray finishing and painting equipment includes many other industrial specialties that speed work and save money. Write and tell us what your problem is.

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J. P. Roche
President

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jury rate today is said to be virtually the same as it was 16 years ago. Brought out was the fact the accidents are no respecters of size or kind of business, but that the majority occur in the 2.5 million small firms.

The close relationship between safety and efficiency is clearly seen when ever accident causes and costs are closely examined, the committee reported. Engineering control of hazards, beginning at the drawing board, stage of building design and continuing through construction and layout will eliminate many accidents. Other accident prevention program fundamentals recommended by the committee are: More widespread inspection, job analysis and accident investigation for detection and correction of hazards; development of American Safety Standards; and recognition of man's physical limitations.

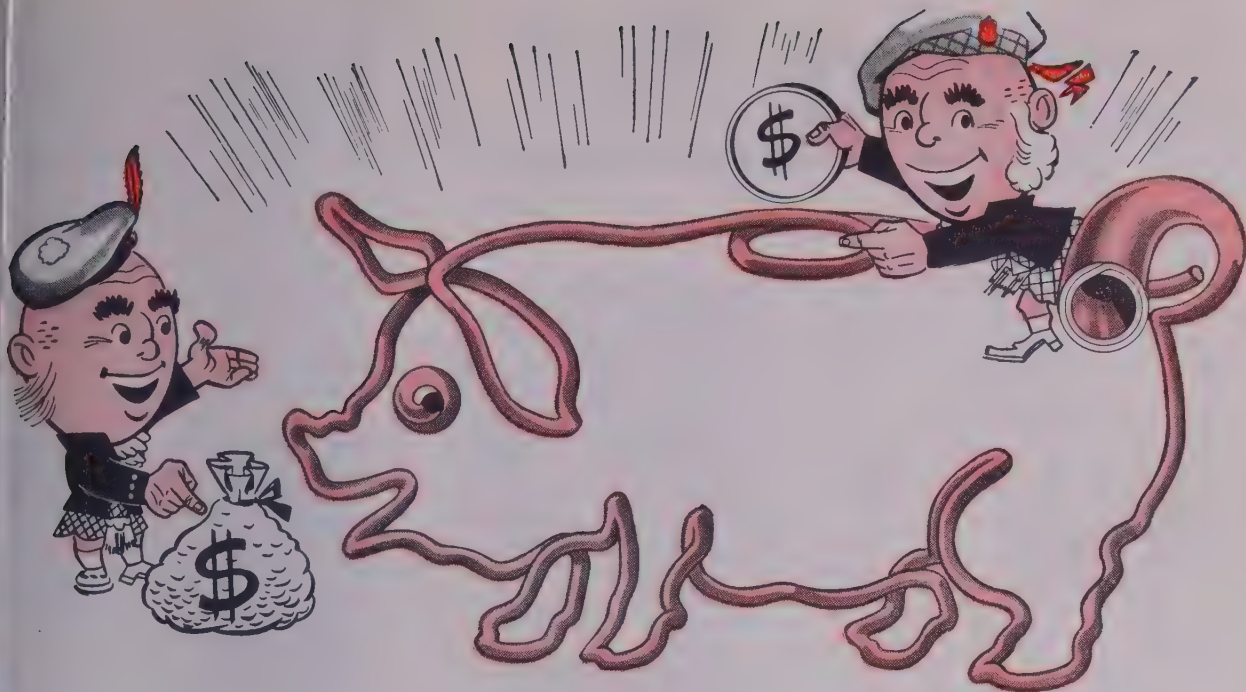
Relationship between accident prevention and efficiency is clearly seen when results of accidents are more closely examined, reported the conference's committee on engineering. Direct losses—medical expenses, compensation costs, incidental legal expenses and overhead—are easily seen, but other costs—spoilage of materials, damage to tools and machinery, decreased productivity of injured employees, absenteeism and replacement costs incidental thereto—often are not figured. Safety through accident prevention should be identified with sound business procedure.

Engineering approach to the control of accident hazards should include, this committee states, a thorough study of the machine, structure, circuit or process under consideration. The study should include the inspection and observation of the behavior of the engineering system with the aid of instrumentation.

As stated previously accident control, to be accomplished successfully, must be an integral part of every production operation. In order to achieve this goal, accident control must begin at the top of any organization, the engineering committee said. Control of the accident situation enhances good employee relations and, at the same time, has an influence upon public relations.

Isotopes Designated as Industrial Materials

Significance and interrelation of atomic energy and industrial materials are pointed out by Dr. Paul C. Aebersold, chief of the Isotopes Division, Atomic Energy Commission, in a 28-page booklet published by



Profit with Bundyweld for your tubing needs

You'll profit in faster production, better design, higher quality or lower cost by using Bundyweld* Steel Tubing. And here's why!

Bundyweld is made by a patented process . . . *the only tubing that is double-walled from a single strip*. Extra-strong and sturdy, it's long-wearing, ductile and easy to fabricate. The tubing walls are bonded throughout all points of contact, making it much more resistant to vibration fatigue and more leakproof than most other types of tubing. And it's lightweight, thinner-walled, faster-cooling. With all this, you'll find that Bundyweld's cost is surprisingly low.

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1 Bundyweld Tubing, made by a patented process, is entirely different from any other tubing. It starts as a single strip of basic metal, coated with a bonding metal.

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Penn.: Rutan & Co., 404 Architects Bldg. • San Francisco 10, Calif.: Pacific Metals Co., Ltd., 3100 19th St. • Seattle 4, Wash.: Eagle Metals Co.,
3628 E. Marginal Way • Toronto 5, Ontario, Canada: Alloy Metal Sales, Ltd., 881 Bay St.

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THE PROFILOMETER measures surface roughness in microinches r.m.s.—quickly, accurately, in the shop—on practically all machined, ground and finished surfaces from $\frac{1}{2}$ " up to several feet in length. Because of the relationship of surface roughness to other gaging and control problems, the Profilometer has become an accepted aid to production economy.

Profilometer is a registered trade name.

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the American Society for Test Materials. Entitled "Isotopes and Their Application in The Field of Industrial Materials," the book contains the 1948 ASTM Edgar M. Burg Lecture given by Dr. Aebersold. He states that science and industry are mutually dependent for progress and support and are stimulating each other.

Discussed in the booklet are general research dividends, useful atomic power, induction of chemical and physical effects, and applications of radioactive and stable isotopes. It points out that the usefulness of the radioisotopes comes from two facts: First, they exhibit the same chemical behavior as the stable species of the elements and second, they emit radiations which will determine their identity and location. Isotope properties, production, and measurement, with pertinent references to facilities and safety precautions are also covered.

Copies of the booklet can be procured from ASTM headquarters, 191 Race St., Philadelphia 3, Pa., for \$1.00.

Program Features Electric Heating

How electric heat, properly applied, can help industry to increase production, provide better equipment designs and improve product quality is shown in the industrial heating program developed by General Electric Co., Schenectady, N. Y. The program, twelfth in the company's "More Power to America" series, consists of a 25-minute sound slide-film, "Heat—Where You Want It", and five different application booklets covering the major uses of tubular, strip and cartridge heaters in industry.

The five major heating applications commonly encountered in manufacturing processes—heating liquids, surfaces, process air, melting soft metals and heating pipelines—are dealt with in the slide film. Through the use of actual case histories, it illustrates how compact electric heaters can be installed as built-in, functional, space-saving components of machines and equipment. Application booklets present the fundamentals of incorporating built-in electric heat into industrial equipment and machines and provide detailed application information.

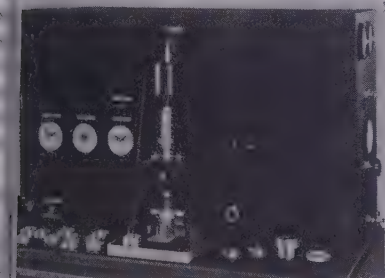
Selection of the correct coupling size for a particular application is made easy with the coupling selector for 3F to 18F size Steelflex couplings, made by Falk Corp., Milwaukee.

STEEL

New Products and Equipment

Comparator Gage

Direct reading of taper variations as small as 0.00005-inch is furnished by an automatic pneumatic comparator gage, made by Moore Products Co., Philadelphia 24, Pa. Bore taper and all finished dimensions on automatic roller bearings may be measured simultaneously by the gage which sorts the pieces that are with-



all five tolerances. Up to 1700 pieces per hour may be gaged. Thickness, outside diameter, large inside diameter and small inside diameter, are measured in one operation by separate air gage components. Positioning of the work is not critical, and accuracy is not affected by the human element or progressive wear. Pneumatic gaging elements are interchangeable, making possible gaging of various sizes of cups. Taper measurement is achieved by applying the air gaging pressures of both the large inside diameter circuit and the small inside diameter circuit to a differential-pressure transmitter.

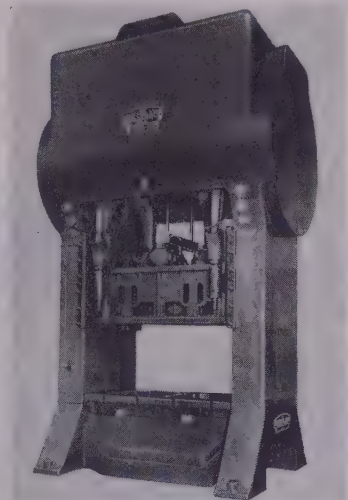
Check No. 1 on Reply Card for more Details

Toggle Press

Compact design of the two point double action toggle press, announced by Cleveland Punch & Shear Works Co., Cleveland 14, O., reduces overall height and contributes to savings in floor space. All gears and the driving unit are enclosed in the box type frame, there being no overhanging brackets or other projections. Presses are arranged with air counterbalance on both inner slide and blankholder slide, with power adjustment to the inner slide by means of an individual motor.

Another feature of the double gear, twin drive electrically controlled press is the extremely long dwell of the blankholder (fully 140 degrees) which enables the dwell to move back with respect to the slide motion. Because of this the blankholder drops approximately 1 inch when the inner

slide is at top center, thereby providing more clearance between the face of the slides and the dies for stock removal. Press, which operates

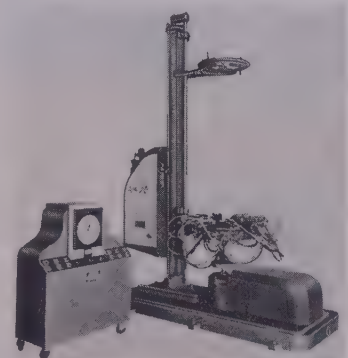


at 8 strokes per minute, has a capacity of 200 tons for the inner slide and 120 tons for the blankholder slide.

Check No. 2 on Reply Card for more Details

Flame Hardening Unit

Stearns-Roger Mfg. Co., Denver 2, Colo., is offering the Denver electronic universal flame hardener which positively controls the four basic methods of flame hardening—spinning, rotary



progressive, vertical progressive, and a combination of the three methods. Temperature can be preset and is automatically held within very close limits during the heating cycle immediately before quenching by a highly sensitive recording electronic heat eye which focuses directly on the work. It relays impulses to the electronic "brain" in the control cabinet, a separate unit.

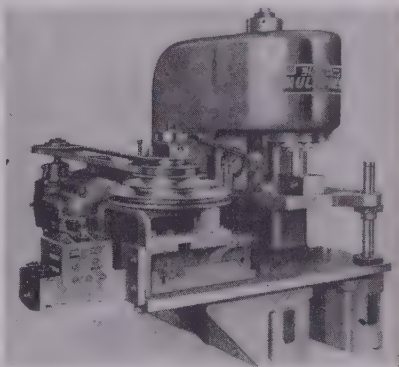
A 1 hp, variable speed motor, controlled by a thyatron unit, is coupled

to the work table spindle so that the drive is either direct or through a compound worm speed reducer. With information from the heat eye, the electronic controller recorder regulates the table rotation speed, table raising and lowering, and regulates the gas flow for flame hardening.

Check No. 3 on Reply Card for more Details

Press Feed Accessory

Automatic feeding of strip stock to punching dies with the Harmonic stock feed accessory enables oil-hydraulic Multipresses to produce as many as 50,000 pieces per hour, according to Denison Engineering Co., 1160 Dublin Rd., Columbus 16, O. Accessory is offered in several models, each providing wide, stepless vari-



ations in speed and feed characteristics within limits of the equipment. Up to approximately 838 cycles per minute are possible with the high-speed unit and as few as 66 cycles per minute at low speeds.

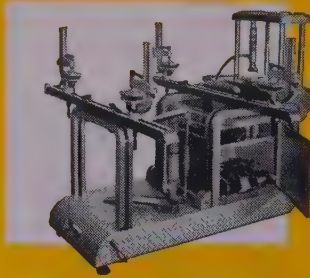
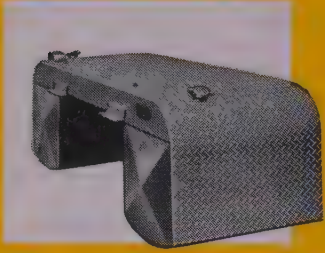
An accuracy of plus or minus 0.002-inch is maintained with the equipment. Coil stock up to 3 inches wide and 3/64-inch thick may be fed up to 3 inches per stroke. Feeding motion is synchronized with the press ram motion. It may be manually turned to locate the dies, eliminating slow set-up. Accessory is available for use with Multipresses up to 8-ton capacity.

Check No. 4 on Reply Card for more Details

Limit Gage

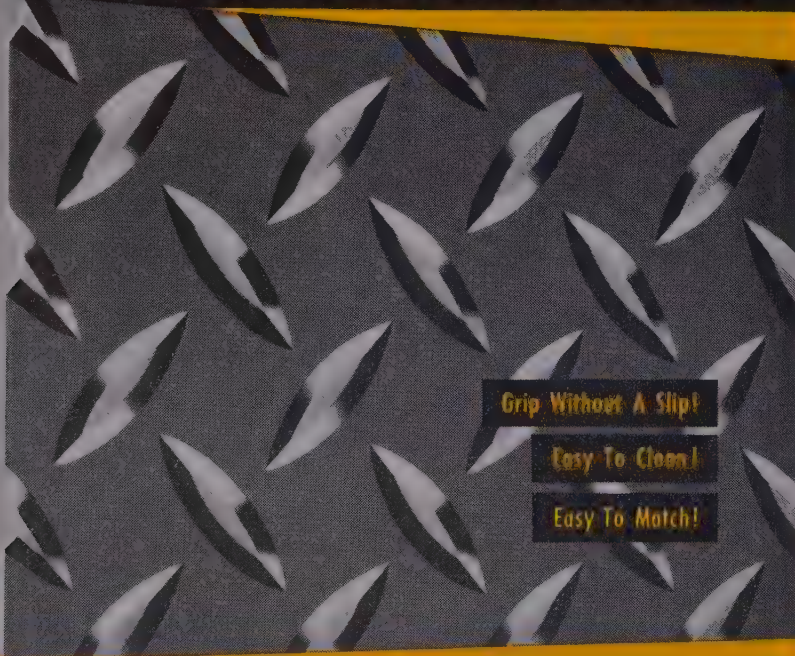
Metal stamping may be protected from injury by material that is too thick with the continuous limit gage developed by Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn. Gage indicates controls by a signal light, control relay, or the like, when the strip or sheet material is too heavy. Gage

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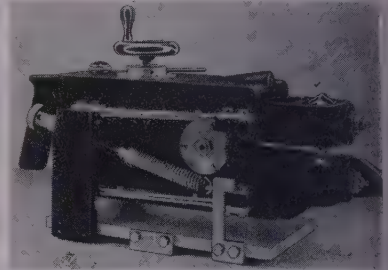
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OTHER PRODUCTS: Permaclad, Stainless Clad Steel • AW Super Grip, Abrasive Floor Plate • Billets • Plates • Sheets (Alloy and Special Grades)

does not show the thickness of the material or the amount of variation but rather indicates when the material is light or heavy, not both.

When used with a die stamping press or similar machine, the gage will send out a signal or impulse that will stop the operation before the

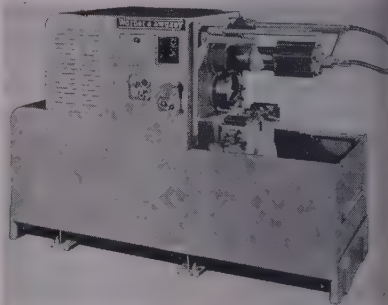


heavy material reaches the die. It can be used for continuous strip inspection where it is desired to control only one limit, high or low. Gage range is from 0 to 0.300-inch with an accuracy of 0.0005-inch. Setting is by means of precision gage blocks.

Check No. 5 on Reply Card for more Details

Chucking Machine

Featuring front and rear cross slides and a five-face overhead turret, the model 1-AC single spindle automatic chucking machine introduced by Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, O., will



handle work up to 8½ inches in diameter and up to 6 inches in turned length. Trip-blocks are set in slots on a pentagonal drum at the rear of the turret shaft to control feeds, spindle speeds, length of cutting stroke and skip indexing. Either or both cross slides can be selected to operate with any or all turret faces.

For maximum rigidity, bearing surfaces on the turret shaft are limited to two, generously dimensioned and enclosed. Tooling stations and controls are easily accessible. Chips drop directly into a large pan below the spindle and may be removed while the machine is in operation. Spindle speed range is from 56 to 1498 rpm

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HOUSTON, TEXAS



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All over America, smart industrial managers are using this principle, and AMERICAN REVOLVER CRANES, to build coal mines in the sky. With this towering, gantry mounted crane they can build stockpiles as high as five story buildings. They can empty a whole train of cars without moving a car.

And when it comes to reloading—as the small picture shows—the big clamshell on the AMERICAN REVOLVER can fill a 50-ton “battleship” in a matter of minutes.

We don't know how you can beat this principle, if you're handling big quantities of bulk materials. It enables you to use hundreds of acres of ground space, if you want—and all the air above it. It gives you speed sufficient to load 100 cars or more per day. It gives you the economy of one-man operation . . . for handling *millions* of tons.

The AMERICAN REVOLVER is made in five basic models, with boom radii of 80 to 150 feet, lifting capacities of 55,000 to 150,000 lbs. Power may be steam, electric, gasoline, diesel or diesel-electric. For literature showing applications and mechanical data, mail the coupon below.

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and eight speeds are available from any given gear set-up. Eighteen feeds, from 0.002 to 0.083-inch are available.

Check No. 6 on Reply Card for more Details

Battery Charger

No manual attention is required during the charging of lead or Edison type batteries with the type S single-circuit battery charger manufactured by Electric Products Co., Cleveland 12, O. To operate, the battery is connected to the charger, the toggle

switch turned to "on" and a button on the charge-control unit pushed for lead batteries or the ampere-hour meter set for Edison batteries. Charger is made in 16 ratings to service the most popular sizes of the two types of batteries.

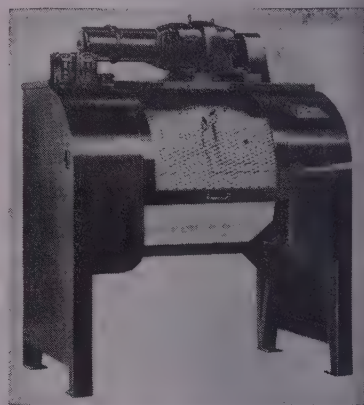
Following operations are automatic: Charging current begins at the proper value; current is controlled throughout the charge; equipment shuts down in case of power failure; when power is restored charging resumes; charger shuts down completely when battery is

fully charged. Control panel motor starter are integral parts of the charger cabinet. Operating preventative maintenance information are affixed permanently to charger.

Check No. 7 on Reply Card for more Details

Deburring Equipment

Versatility, maximum safety and ease of operation feature the model DB-200 Supersheen deburring and finishing barrel, developed by Alm Division, Queen Stove Works Inc., Albert Lea, Minn. Barrel speed variable from 6 to 30 rpm. Safe is assured with a rollaway per-



rated hood which permits positioning of the barrel with the hood down. There are no protruding parts or door handles.

A positive magnetic break allows inching the barrel into position. Doors are cam-operated for quicker opening and closing. Forward and reversing safety switches are provided. Barrel is available unlined or with a Neoprene lining.

Check No. 8 on Reply Card for more Details

Coating Thickness Gage

Thickness of nonmagnetic coatings on iron and steel may be read rapidly and without damage to the coating with the Coatingage, an instrument developed by Branson Instruments Inc., 436 Fairfield Ave., Stamford, Conn. Thickness is indicated directly on the meter of the instrument, its two concentric scales covering a range of 0.0001 to 0.50-inch. A self-contained battery power supply permits its use in the field as well as in the laboratory or on the production line.

Gage head contains a coil, connected to a bridge circuit. Coating thickness is measured by the effect of changes in the reluctance of the magnetic circuit. Instrument is housed in a carrying case measuring

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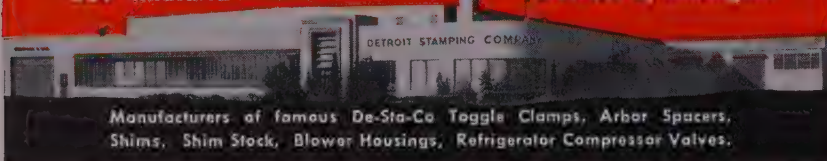


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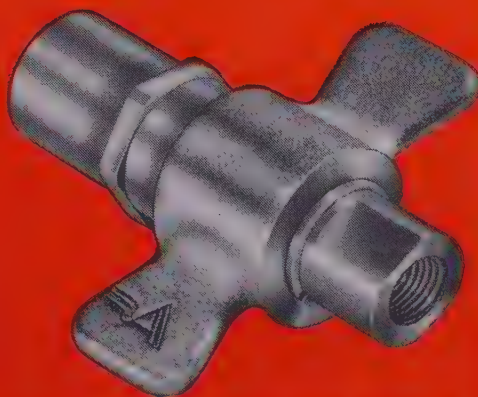
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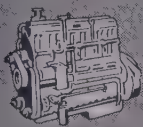
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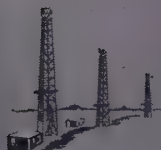
HEAVY HIGHWAY EQUIPMENT



MARINE EQUIPMENT



BUSES



OIL FIELDS

8 x 9 x 6 and weighing 10 pounds. Power is furnished by two 67½ v batteries and one 1½ v battery, contained in the instrument. Thickness readings are within 10 per cent of the actual thickness.

Check No. 9 on Reply Card for more Details

Load Handling Forks

Bricks, barrels, boxes and bags may be lifted with hydraulically operated load handling forks developed by Buda Co., Harvey, Ill., for its fork lift trucks. A feature of the fork is a gripping of the load until the load weight is relieved.

Forks are offered in three main styles: Two forks for holding the sides of a barrel or unit load of package goods, four rubber padded forks for gripping the bottom tiers of bricks or similar items and four semicurved forks for lifting two rows of bags.

Check No. 10 on Reply Card for more Details

• • •

CENTRIFUGAL SWITCH: Euclid Electric & Mfg. Co., Madison, O., announces a redesigned centrifugal switch for plugging, overspeed or underspeed protection, nonplugging and motion interlocking. Available in dust-tight and oil resistant enclosures for surface or flange mounting, it has an operating range for contacts to open or close from minimum of 125 rpm to 2530 rpm.

Check No. 11 on Reply Card for more Details

OFFSET TOOL: A line of offset tools with mechanically held Kennametal tips for machining operations such as facing with tool shank perpendicular to the work, or turning with tool shank parallel to the work axis, is announced by Kennametal Inc., Latrobe, Pa. Tools are available in five sizes.

Check No. 12 on Reply Card for more Details

PLASTIC REFRACTORY: A new plastic refractory known as DPM (dry pre-mixed) Ramtite is announced by Ramtite Co., Chicago 8, Ill. It will not dry out in storage because it is shipped dry. It is pre-mixed at the factory so that no additional mixing is necessary. Just spread out, add water from a sprinkling can and it is ready for use.

Check No. 13 on Reply Card for more Details

TOOL HOLDER: Maxwell Co., Bedford, O., announces a new Auto-Recess tool holder which has been designed to perform automatic recessing operations on high speed automatic machines. Tool employs a segmented-type gear mechanism which is designed to reduce ratio of

cutter feed to workpiece, taking into consideration regular cam feed for drills and other end forming tools. Available in three sizes of 1½, 2 and 3; sizes indicate size of slide tool holder on automatic machine that tool shank will fit.

Check No. 14 on Reply Card for more Details

UTILITY RACKS: Five rack models to handle all plating jobs have been announced by Belke Mfg. Co., Chicago 51, Ill. They are coated with Universal plastic to withstand all cleaning and plating cycles. All models are available in 30 and 36-inch lengths, assembled or unassembled.

Check No. 15 on Reply Card for more Details

ETCHER-DEMAGNETIZER: Crown Industrial Products Co., Chicago, Ill., introduces a new combination etcher-demagnetizer that permits marking and demagnetizing of tools in one operation. There are 14 etching heats ranging from 90 to 1350 w and anything made of iron, steel or its alloys can be marked.

Check No. 16 on Reply Card for more Details

ROTAMETER: Brooks Rotameter Co., Lansdale, Pa., offers a new Multi-Tube rotameter which can be built with two or more rotameter tubes in it for use on related flows. Each tube with fittings may be removed without disturbing the other parts. Unit is effective for applications such as "reflux" and "product" in a continuous still, water to a battery of coolers, continuous dilution, continuous purging.

Check No. 17 on Reply Card for more Details

RESIN MATERIAL: A resin with resistance to acids, alkalis and solvents at temperatures as high as 325° F and with resistance to foot traffic and material handling has been developed by Carboline Co., St. Louis 5, Mo. Known as Carbo-Flex, it may be used for lining wood tanks and protecting concrete floors.

Check No. 18 on Reply Card for more Details

HEIGHT GAGE: A new vernier height gage, offered by Vard Inc., Pasadena 8, Calif., has a slotted base which makes possible direct readings from 0 to 6 inches. Zero setting can be maintained at all times because vernier scale is adjustable.

Check No. 19 on Reply Card for more Details

COATINGS: Felseal, developed by Felt Products Mfg. Co., Chicago 7, Ill., is a sealing material with high resistance to pressures, chemical action and heat. Castings and machined parts are sealed efficiently without using a finishing cut or

surface grinding. It can be applied to any fibrous type base material in film thicknesses of 0.001 to 0.005 inch.

Check No. 20 on Reply Card for more Details

ELECTRODE HOLDERS: Six new electrode holders for the inert-gas process have been announced by General Electric's Welding Division, Schenectady, N. Y. Manual holders are available in 100, 200, 400 and 800 amp ratings and the holder for machine weldings in ratings of 400 and 800 amp.

Check No. 21 on Reply Card for more Details

POLARITY CAP: A new magnet polarity cap for its voltage tester is announced by Square D Co., Detroit 11, Mich. Cap, made of transparent plastic, screws on top of tester. It contains a two-color magnet on a rotating shaft.

Check No. 22 on Reply Card for more Details

TENSION WRENCH: A new improved tension wrench is announced by Sunnen Products Co., St. Louis Mo. It has a high limit of 100 foot-pounds which can be increased to 150 foot-pounds by using an extension designed for the purpose. It is calibrated in both foot-pounds and centimeter-kilograms.

Check No. 23 on Reply Card for more Details

SURFACING: Designated as Quar-tex, a new floor surfacing material, announced by United Laboratories Inc., Cleveland 12, O., is designed to resist severe conditions. It is recommended for surfacing floors subjected to alkalis, oil, grease, fats and other destructive elements. It is applied directly over the old surface.

Check No. 24 on Reply Card for more Details

LETTERING PRESS: Model No. 40A numbering and lettering press is designed for impressing letters and numbers in all kinds of name plates, motor plates, letter box plates and similar flat metal parts. Made by Numberall Stamp & Tool Co., Staten Island 12, N. Y., different size dials of the unit are interchangeable, but each size character requires a different spacing rack.

Check No. 25 on Reply Card for more Details

FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

LOW POINT in the current recession may be struck in the steel industry this month. Less steel, it appears, will be shipped over the next two weeks than at any time in recent years, barring important strike periods. In addition to general dullness in demand, more consuming plants are closing down for mass vacations than ever before, and throughout the country more steel producing plants are either shutting up shop completely or are suspending operations in various departments for the same reason. Scheduled Fourth of July holiday suspensions in the steel industry this year are greater than in many years.

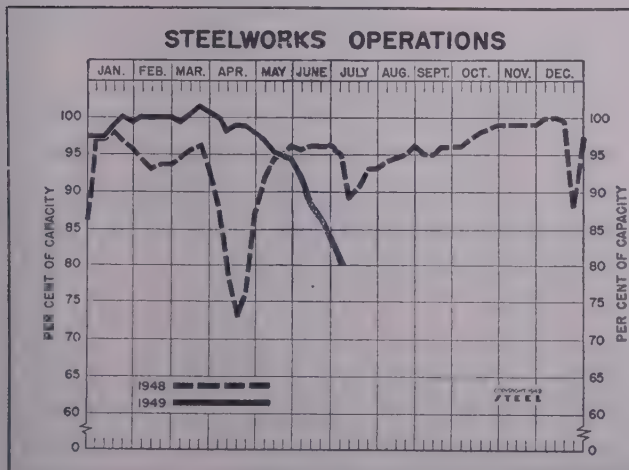
OUTLOOK— While the business outlook continues clouded some steel trade leaders are of the opinion demand will hit the low point this month. They anticipate a slight gain in ordering in August, with some further improvement in volume as fall gets under way. However, should major strikes develop in the coal and steel industries, particularly the latter, the low point in steel shipments may come later than in July, the movement of tonnage this month actually being stimulated by protective buying in event the signs definitely indicate a steel strike in the offing. Negotiations over the steel wage and pension question have not yet reached the stage where accurate appraisal of the outlook is possible. U. S. Steel subsidiaries are expected to resume negotiations with the union this week.

OPERATIONS—Declining for the eleventh consecutive week, steelmaking operations dropped 4½ points during the period ended July 2 to 80 per cent of capacity. This is the lowest level recorded since April, 1948, when the industry was hampered by a coal strike. A further sharp drop in operations is scheduled for the July 4 holiday week.

SUPPLIES—Steel mill order backlogs continue

to shrink with consumers, in the main, restricting purchases to immediate requirements. At the same time users are still reducing inventories and in some cases these are understood to have dropped to the danger point which may necessitate some emergency buying over coming weeks to support manufacturing operations. As a general thing, steel product deliveries are greatly shortened as compared with only three months ago. In some cases structural shapes are available in three to four weeks. The same is true with respect to plates with sellers displaying increasing interest in export business. Pressure for hot carbon bars is at lowest point in years with some producers offering shipments before the end of this month on most specifications. Coated products, particularly standard galvanized sheets, continue to be the most scarce of the light flat-rolled products with some makers booked solidly into September.

PRICES—No major price changes were reported in the steel markets last week but the undertone continued weak with the few sellers still quoting premium prices under pressure. Hopes of buyers for a general downward steel price adjustment persist though leading steel producing interests have indicated no substantial adjustments are likely in view of continued high production costs. Expectations are future price policy will remain uncertain until the steel wage question is definitely settled. Meanwhile, the scrap market continues weak, prices tending downward at most consuming points with buying at low ebb. STEEL's composite on steelmaking scrap declined last week to \$19.50 from \$20.17 the preceding week. Last year at this time the scrap composite stood at \$40.67. Other price composites held unchanged last week and compared with the like week of 1948 as follows: Finished steel, \$91.82 and \$80.27; semifinished steel, \$63.12 and \$75.75; steelmaking pig iron, \$45.60 and \$40.93.



DISTRICT STEEL RATES				
Percentage of Ingot in Leading		Capacity Districts	engaged	
	Week Ended July 2	Change	Same 1948	Week 1947
Pittsburgh	81	None*	95.5	59
Chicago	93.5	— 2	95	93
Eastern Pa.	74	— 6.5	90	84
Youngstown	90	+ 2	102	40
Wheeling	70.5	+ 4.5	85.5	63
Cleveland	55.5	+ 0.5*	90.5	42.5
Buffalo	85	None*	101	85.5
Birmingham	100	None	100	87
New England	30	— 28	79	85
Cincinnati	99	+ 8	102	72
St. Louis	83	+ 1	82	82
Detroit	106	+ 3	103	92
Western	81.5	— 0.5	...	...
Estimated national rate	80	— 4.5	95	73

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. *Revised.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	July 2	June 25	Month Ago June 1949	Year Ago July 1948	5 Years Ago July 1944
Finished Steel	\$91.82	\$91.82	\$92.06	\$80.27	\$56.73
Semifinished Steel	63.12	63.12	65.28	68.62	36.00
Steelmaking Pig Iron	45.60	45.60	45.60	40.49	23.00
Steelmaking Scrap	19.50	20.17	20.85	40.67	19.17

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin andterne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip, May, 1949, figure is preliminary.

FINISHED STEEL

WEIGHTED COMPOSITE†

May 1949	3.98873c
Apr. 1949	4.02031c
Mar. 1949	4.05098c
May 1948	3.58321c
May 1944	2.44428c

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	July 2, 1949	June, 1949	Apr., 1949	July, 1948
Steel bars, Pittsburgh mills.....	3.35c	3.35c	3.35c	3.105c
Steel bars, del. Philadelphia.....	3.8164	3.8164	3.8164	3.545
Steel bars, Chicago mills.....	3.35	3.35	3.35	3.065
Shapes, Pittsburgh mills.....	3.25	3.25	3.25	2.975
Shapes, Chicago mills.....	3.25	3.25	3.25	2.965
Shapes, del. Philadelphia.....	3.4918	3.4918	3.4918	3.18
Plates, Pittsburgh mills.....	3.40	3.40	3.50	3.155
Plates, Chicago mills.....	3.40	3.40	3.40	3.115
Plates, del. Philadelphia.....	3.5848	3.5848	3.6348	3.41
Sheets, hot-rolled, Pittsburgh mills.....	3.25	3.25	3.26	2.975
Sheets, cold-rolled, Pittsburgh.....	4.00	4.00	4.00	3.70
Sheets, No. 10 galv., Pittsburgh.....	4.40	4.40	4.40	4.10
Sheets, hot-rolled, Gary mills.....	3.25	3.25	3.25	2.965
Sheets, cold-rolled, Gary mills.....	4.00	4.00	4.00	3.70
Sheets, No. 10 galv., Gary mills.....	4.40	4.40	4.40	4.10
Strip, hot-rolled, Pittsburgh mills.....	3.25	3.25	3.50	3.140
Strip, cold-rolled, Pittsburgh mills.....	4.375	4.375	4.375	3.965
Bright basic, wire, Pittsburgh.....	4.15	4.15	4.15	3.965
Wire nails, Pittsburgh mills.....	5.15	5.15	5.15	5.255
Tin plate, per base box, Pitts. dist.	\$7.75†	\$7.75†	\$7.75†	\$6.74

Pig Iron

	July 2, 1949	June, 1949	Apr., 1949	July, 1948
Bessemer, del. Pittsburgh (N.&S. sides)	\$48.08	\$48.08	\$48.08	\$44.08
Basic, Valley.....	46.00	46.00	46.00	40.60
Basic eastern, del. Philadelphia.....	49.39	49.39	49.6175	43.77
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	43.58
No. 2 fdry., del. Philadelphia.....	49.89	49.89	50.1175	44.27
No. 2 foundry, Chicago.....	46.25	46.25	46.25	41.10
No. 2 foundry, Valley.....	46.50	46.50	46.50	41.10
Southern No. 2 Birmingham.....	36.38	39.38	43.38	40.72
Southern No. 2 del. Cincinnati.....	45.43	45.43	49.43	46.43
Malleable, Valley.....	46.50	46.50	46.50	40.30
Malleable, Chicago.....	46.50	46.50	46.50	41.50
Charcoal, low phos., Job Lyles, Tenn.	68.00	68.00	68.00	59.60
Ferromanganese, f.o.b. Etna, Pa. ..	175.00	175.00	175.00	151.15*

* F.o.b. cars Pittsburgh.

SCRAP

Heavy melt, steel, No. 1, Pittsburgh	\$21.00	\$23.60	\$25.12	\$40.75
Heavy melt, steel, No. 2, E. Pa. ...	17.00	17.75	20.69	40.00
Heavy melt, steel, No. 1, Chicago...	19.50	20.70	23.75	40.05
Heavy melt, steel, No. 1, Valley...	18.50	21.30	22.75	40.75
Heavy melt, steel, No. 1, Cleveland.	15.00	17.80	20.38	40.25
Heavy melt, steel, No. 1, Buffalo...	19.25	20.35	24.38	44.30
Rails for re-rolling, Chicago.....	27.75	27.75	31.31	57.80
No. 1 cast, Chicago.....	27.50	27.50	30.25	68.50

COKE

Connellsville, beehive furnace.....	\$13.25	\$13.70	\$14.44	\$14.25
Connellsville, beehive foundry	15.75	16.15	17.00	17.00
Chicago, oven foundry, ovens.....	20.00	20.24	20.40	19.86

Semifinished

Sheet bars, mill	\$67.00*	\$67.00*	\$67.00*	\$62.80
Slabs, Chicago	52.00	52.00	52.00	47.80
Re-rolling billets, Pittsburgh.....	52.00	52.00	52.00	47.80
Wire rod $\frac{3}{8}$ to $\frac{1}{2}$ -inch, Pitts. dist..	3.40c	3.40c	3.775c	3.415c

* Nominal. † 1.50 lb coating.

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Re-rolling quality, standard analysis, nominal. Forging quality, \$50 per net ton mill.

Alloy Steel Ingots: \$51 per net ton, mill.

Re-rolling Billets, Blooms, Slabs: \$52 per net ton, mill, except: \$57, Conshohocken, Pa.; \$71, Fontana, Calif.

Forging Quality Billets, Blooms, Slabs: \$61 per net ton, mill, except: \$63, Conshohocken, Pa.; \$80, Fontana, Calif.

Alloy Billets, Slabs, Blooms: Re-rolling quality, \$63 per net ton, mill except: \$65 Conshohocken, Pa.; \$82, Fontana, Calif.

Sheet Bars: Nom., per net ton, mill; sales in open market \$55-\$60 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: \$76 per net ton, mill.

Wire Rods: Basic and acid open-hearth, 7/32 & $\frac{1}{2}$ -inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester, Mass.; 4.05c, Pittsburgh, Calif.; 4.10c, Los Angeles. Basic open-hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c Atlanta; 3.55c, Ecorse, Mich.; 3.75c, Houston; 3.95c, Kansas City; 4.00c, Fontana, Calif.; 4.05c, Pittsburgh, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.25c, Minniqua, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., and Moline, Ill.; 4.00c, Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.48c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.00c, Fontana, Calif.; 3.75c, Houston; 3.95c, Kansas City; 4.05c, Pittsburgh, Torrance, Calif.; 4.10c, Seattle, S. San Francisco, Los Angeles; 4.25c, Minniqua, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18-gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.65c, Houston; 3.35c, Conshohocken, Pa.; 3.95c, Pittsburgh, Torrance, Calif.; 4.15c, Fontana, Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama

City, Ala.; 5.05c, Torrance, Calif.; 5.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.90c, Fontana, Calif.; 4.95c, Pittsburgh, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.80c, Kokomo, Ind.; 5.15c, Pittsburgh, Torrance, Calif.

Galvannealed Sheets: 4.95c, mill, except: 5.30c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburgh, Torrance, Calif.

Long Terns, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c mill, except: 4.60c Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren. Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.

Motor: 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.

Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill, 58, 9.30c, mill, 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.40c, Atlanta; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Houston; 3.85c, Kansas City, Mo.; 4.0c, Pittsburgh, Torrance, Calif.; 4.25c, Little San Francisco, Los Angeles; 4.30c, Minnequa, Colo.; 4.40c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip (0.25 carbon and less); 4.50c, mill, except: 4.00-4.25c, Warren, O.; 4.50c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.50c, Dover, O.; 4.25-4.45c, Detroit; 4.60c, New Haven, Conn.; 4.75c, New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.55c, Wallingford, Conn.; 4.90c, Fontana, Calif.; 4.75c, Los Angeles. One company quotes 4.50c, Pittsburgh base; another, 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, Boston, Youngstown; 4.60c, Wallingford, Conn. Over 0.40 to 0.60 C, 4.00c, mill except: 5.65c, Chicago; 5.75c, Worcester, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J. Over 0.80 to 1.05 C, 8.05c, mill, except: 8.20c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 10.0c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 5.50c, mill, except: 5.15c, Ecorse, Mich. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

In, Terne, Plate

Terne Plate: American Coke, per base box of 20 lb, 1.25 lb coating \$7.50-\$7.70; 1.50 lb coating \$7.75-\$7.95. Pittsburgh, Calif., mill quotes \$8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 55 to 123 lb basis weight \$5.75-\$5.85. Pittsburgh, Calif., mill, \$6.50.

Black Making Black Plate: Per base box of 100 lb, 55 to 123 lb basis weight \$5.75-\$5.85. Pittsburgh, Calif., mill, \$6.50.

Floware Enameling Black Plate: 29-gage, 10c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, \$6.65, except: \$6.75 Fairdale, Ala., Sparrows Point, Md.

Coating Ternes: Per package 112 sheets; 20 x 48 in., coating I.C. 8-lb, \$17.50.

lates

Carbon Steel Plates: 3.40c, mill, except: 3.50c, Crawfordsville, Pa.; Claymont, Del.; Conchochicken, Pa.; Harrisburg, Pa.; 3.65c, Ecorse, Mich.; 3.80c, Houston; 4.00c, Fontana, Calif.; 4.30c, Seattle, Minnequa, Colo.; 6.25c, Kansas City, Mo.

Alloy Plates: 4.55c, mill.

Pen-Hearth Alloy Plates: 4.40c, mill, except: 5.00c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.40c, Ecorse, Mich.

hapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa.; Lackawanna, N. Y.; 3.65c, Houston; 3.80c, S. San Francisco, Fontana, Calif.; 3.85c, Kansas City, O., Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, Los Angeles.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, basic or Bessemer Wire, 4.15c, mill, except: 2.50c, Sparrows Point, Md.; Kokomo, Ind.; 4.50c, Worcester, Mass.; 4.50c, Minnequa, Colo.; Atlanta, Buffalo; 4.75c, Kansas City, O.; 4.80c, Palmer, Mass.; 5.10c, Pittsburgh, N.Y.; 6.15c, S. San Francisco. One producer quotes 4.15c, Chicago base; another 4.50c,

Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburgh, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md.; Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburgh, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill except: 4.90c, Sparrows Point, Md.; Kokomo, Ind.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.75c, S. San Francisco, Pittsburgh, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md.; Kokomo, Ind.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburgh, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md.; Kokomo, Ind.; Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo.; Cleveland; 123, Pittsburgh, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 113, Crawfordsville, Ind.; 111 Houston, freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Kokomo, Ind.; Atlanta; 116, Minnequa, Colo.; 132, Pittsburgh, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md.; Kokomo, Ind.; Atlanta; 130, Minnequa, Colo.; 143, Pittsburgh, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Col. 114, Duluth; 121, Moline, Ill.; 122, Minnequa, Colo.; 125, Johnstown, Pa.; \$120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md.; Kokomo, Ind.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburgh, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301.....	28.50	30.50	37.50
302.....	28.50	33.00	37.50
303.....	31.00	36.50	39.50
304.....	30.00	35.00	39.50
318.....	46.00	55.00	53.00
321.....	34.00	44.50	45.50
347.....	38.50	48.50	50.00

STRAIGHT CHROMIUM STEELS

410.....	22.75	26.50	32.00
416.....	23.25	28.25	32.50
430.....	23.25	27.00	34.75
446.....	32.50	60.00	46.50

STAINLESS-CLAD STEELS

Type	Plates		Sheets	
	Cladding		Cladding	
	10%	20%	10%	20%
302.....	.....	.....	19.75	21.50
304.....	22.50	26.50	20.75	22.50
310.....	32.50	36.50	.....	.....
316.....	27.00	31.00	26.00	28.00
321.....	23.50	27.50	.....	.....
347.....	25.00	29.00	24.00	26.00
405.....	18.75	24.75	.....	.....
410.....	18.25	24.25	.....	.....
430.....	18.25	24.25	.....	.....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

For prices of bolts, nuts, rivets and washers please refer to June 20 issue, Page 155.

Tubular Goods

Standard Steel Pipe: Eastern mill carlot prices, threaded and coupled, to consumers about \$200 a net ton. Discounts from base:

In.	Blk.	Gal.	In.	Blk.	Gal.
1/2.....	39 1/2	11	1.....	46 1/2	30 1/2
3/4.....	41 1/2	13 1/2	1 1/4.....	48 1/2	33 1/2
1.....	37 1/2	13	1 1/2.....	47	31
1 1/4.....	39 1/2	15 1/2	2.....	49	34
1 1/2.....	36	12 1/2	2 1/4.....	47 1/2	31 1/2
2.....	41	23 1/2	2 1/2.....	48	32
2 1/4.....	43	26 1/2	3.....	50	35
2 1/2.....	44	27 1/2	3 1/2.....	48 1/2	32 1/2
3.....	46	30 1/2	4.....	50 1/2	35 1/2
			3 1/2 & 4	44 1/2	29

In.	Lap Weld Blk.	Gal.	Elec. Weld Blk.	Gal.	Seamless Blk.	Gal.
2....	40 1/2	25	38 1/2	23	28	12 1/2
2 1/2..	44 1/2	29	41 1/2	26	33 1/2	13
3....	44 1/2	29	41 1/2	26	36	20 1/2
3 1/2 & 4	42 1/2	26	43 1/2	28	41 1/2	26
5 & 6.	46 1/2	31	43 1/2	28	43 1/2	28
7....	44 1/2	29	43 1/2	28	43 1/2	28

Line Steel Pipe: Mill prices in carlots to consumers about \$200 a net ton.

In.	Blk.	Gal.	In.	Blk.	Gal.
1/2.....	40 1/2	12 1/2	1 1/4.....	46	32
3/4.....	38 1/2	14 1/2	1 1/2.....	48	33
1.....	35	11 1/2	1 3/4.....	46 1/2	32 1/2
1 1/4.....	40	24 1/2	1 1/2.....	48 1/2	33 1/2
1 1/2.....	42	25 1/2	2.....	47	33
2.....	43	28 1/2	2 1/4.....	49	34
2 1/4.....	45	29 1/2	2 1/2 & 3.	47 1/2	33 1/2
2 1/2.....	45 1/2	31 1/2	3.....	49 1/2	34 1/2
3.....	47 1/2	32 1/2	3 1/2 & 4.	43 1/2	28

In.	Lap Weld Blk.	Gal.	Elec. Weld Blk.	Gal.	Seamless Blk.	Gal.
2....	39 1/2	24	37 1/2	22	27	11 1/2
2 1/2..	43 1/2	28	40 1/2	25	32 1/2	17
3....	43 1/2	28	40 1/2	25	35	19 1/2
3 1/2 & 4.	41 1/2	28 1/2	42 1/2	27	37 1/2	22
5 & 6	45 1/2	30	42 1/2	27	42 1/2	27
8....	43 1/2	28 1/2	44 1/2	28	44 1/2	28
10....	45	28 1/2	44	27 1/2	44	27 1/2
12....	44	27 1/2	43	26 1/2	43	26 1/2

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about \$200 a net ton.

In.	Blk.	Gal.	In.	Blk.	Gal.
3/4...	+59	+90	1 1/4..	+22	+47 1/2
1.....	+20	+47	1 1/2..	+15 1/2	+40
1 1/4..	+10	+36	2....	+7 1/2	+31
1 and 1 1/4	.....	.....	2 1/2-3	+5	+26 1/2
1 1/2	+4	+27	4....	List	+20 1/2
1 3/4	+2	+23 1/2	4 1/2-8	+2	+22
2....	-2 1/2	+23	9-12.	+12	+31 1/2

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D. B.W.		Seamless		Elec. Weld	
In.	Ga.	H.R.	C.D.	H.R.	C.D.
1	13	11.50	13.39	13.00	13.00
1 1/4	13	13.62	15.87	13.21	15.39
1 1/2	13	15.05	17.71	14.60	17.18
1 3/4	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2 1/4	13	21.37	25.16	20.73	24.40
2 1/2	12	23.54	27.70	22.83	26.88
2 3/4	12	25.79	30.33	25.02	29.41
3	12	27.33	32.14	26.51	31.18
3 1/4	12	28.68	33.76	27.32	32.74
3 1/2	11	33.39	39.29	32.39	38.11
3 3/4	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4 1/2	9	58.99	69.42	.....	.....
5	9	68.28	80.35	.....	.....
6	7	104.82	123.33	.....	.....

Pipe Cast Iron: Class B, 6-in. and over, \$82.50-\$93.50 per net ton, Birmingham; \$87.50, Burlington, N. J.; 4-in. pipe, 55 higher; Class A pipe, \$5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; \$3.20 per 100 lb mill, except: \$3.30, Minnequa, Colo.
Light (bullet): \$3.55 per 100 lb, mill, except: \$4.25, Minnequa, Colo.
Light (rail steel): \$3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.
Railroad Supplies: Track bolts, treated: \$8.50 per 100 lb, mill. Untreated: \$8.25, mill.
Tie Plates: 4.05c mill, except: 4.20c, Pittsburgh, Torrance, Calif.; 4.50c, Seattle.
Splice Bars: 4.25c, mill.
Standard Spikes: 5.35c, mill.
Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

	Per Gross Ton			
	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace....	\$48.00	\$48.50	\$49.00	\$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.		52.634	53.134	....
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.		45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
Chicago, district furnaces..	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del.		51.28-51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Duluth, furnace		46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace....		50.00	50.50	....
Geneva, Utah, furnace....	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.		54.0578	....	....
Portland, Oreg., del.		54.0578	....	....
Los Angeles, San Francisco	53.5578	....	....	....
Granite City, Ill., furnace...	47.90	48.40	48.90	....
St. Louis, del.	48.65*	49.15*	49.65*	....
Ironton, Utah, furnace....	47.00	47.50	....	....
Lone Star, Tex., furnace....	46.00	46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
Neville Island, Pa., furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace....	46.00	46.50	46.50	47.00
Steelton, Pa., furnace....	48.00	48.50	49.00	49.50
Struthers, O., furnace....	46.00	....	....	....
Swedeland, Pa., furnace....	48.00	48.50	49.00	49.50
Philadelphia, del.	49.39	49.89	50.39	50.89
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Troy, N. Y., furnace....	48.00	48.50	49.00	....
Youngstown, O., furnace....	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

* Including 3 per cent federal transportation tax.

† Low phosphorus southern grade.

‡ To Neville Island base add: \$0.86 for McKees Rocks, Pa.; \$1.31 Lawrenceville, Homestead, McKeesport, Monaca; \$1.73 Verona; \$1.94 Braekensridge; \$1.08 for Ambridge and Alliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Metallurgical Coke

	Price per Net Ton
Beehive Ovens	
Connellsville, furnace...	\$13.00-13.50
Connellsville, foundry...	15.50-16.00
New River, foundry...	18.00
Wise county, foundry...	15.35
Wise county, furnace...	14.60
Oven Foundry Coke	
Kearney, N. J., ovens.	\$22.00
Everett, Mass., ovens.	....
New England, del.	22.70
Chicago, ovens	20.00
Chicago, del.	21.45
Detroit, del.	23.76
Terre Haute, ovens....	20.20
Milwaukee, ovens	20.75
Indianapolis, ovens	19.85
Chicago, del.	23.19
Cincinnati, del.	22.66
Detroit, del.	23.61
Ironton, O., ovens....	19.40
Cincinnati, del.	21.63
Painesville, O., ovens....	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens....	20.40
Portsmouth, O., ovens....	19.50
Detroit, ovens	20.65
Detroit, del.	21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, \$1.05; †, \$1.45. ‡ or within \$4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens	
(Price effective as of Aug. 5)	
Pure benzol	20.00
Toluol, one degree....	19.00-23.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	\$45.00
Per pound, ovens	
(Effective as of Oct. 1)	
Phenol, 40 (carlots, re-	
turnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars	12.50
(Effective as of Oct. 25)	
Napthalene flakes,	
balls, bbl to jobbers,	
"household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick	
Super Duty: St. Louis, Vandalia,	
Farber, Mexico, Mo., Olive Hill,	
Ky., Clearfield, or Curwensville,	
Pa., Ottawa, Ill., \$100. Hard-	
fired, \$135 at above points.	
High-Heat Duty: Salina, Pa., \$85;	
Woodbridge, N. J., St. Louis,	
Farber, Vandalia, Mexico, Mo.,	
West Decatur, Orviston, Clear-	
field, Beach Creek, or Curwens-	
ville, Pa., Olive Hill, Hitchins,	
Haldeman, or Ashland, Ky.,	
Troup, or Athens, Tex., Stevens	
Pottery, Ga., Portsmouth, or Oak	
Hill, O., Ottawa, Ill., \$80.	
Intermediate-Heat Duty: St. Louis,	
or Vandalia, Mo., West Decatur,	
Orviston, Beach Creek, or Clear-	
field, Pa., Olive Hill, Hitchins,	
or Haldeman, Ky., Athens, or	
Troup, Tex., Stevens Pottery, Ga.,	
Portsmouth, O., Ottawa, Ill., \$74.	
Low-Heat Duty: Oak Hill, or Ports-	
mouth, O., Clearfield, Orviston,	
Pa., Bessemer, Ala., Ottawa, Ill.,	
\$66.	
Ladle Brick	
Dry Press: \$55, Freeport, Merrill	
Station, Clearfield, Pa.; Chester,	
New Cumberland, W. Va.; Iron-	
dale, Wellsville, O.	
Wire Cut: \$53, Chester, New Cum-	
berland, W. Va.; Wellsville, O.	
Malleable Bung Brick	
St. Louis, Mo., Olive Hill, Ky.,	
Ottawa, Ill., \$90; Beach Creek,	
Pa., \$80.	
Silica Brick	
Mt. Union, Claysburg, or Sproul,	
Pa., Ensley, Ala., \$80; Hays, Pa.,	
\$85; Joliet or Rockdale, Ill., E.	

Chicago, Ind., \$89; Lehi, Utah
Los Angeles, \$95.
Eastern Silica Coke Oven Shapes
Claysburg, Mt. Union, Sproul
Pa., Birmingham, \$80.
Illinois Silica Coke Oven Shapes
Joliet or Rockdale, Ill., E. Chi-
cago, Ind., Hays, Pa., \$81.**Basic Brick**
(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)
Burned chrome brick, \$66; Chem-
ical-bonded chrome brick, \$69;
magnesite brick, \$91; chemical-
bonded magnesite, \$80.**Magnesite**
(Base prices per net ton, f.o.b. works, Chewelah, Wash.)
Domestic dead-burned, 3/4" grains;
Bulk, \$30.50-31.00; single paper
bags, \$35.00-35.50.**Dolomite**
(Base prices per net ton)
Domestic, dead-burned bulk: Bill-
meyer, Blue Bell, Williams, Ply-
mouth Meeting, Pa., Millville, W.
Va., Narlo, Millersville, Martin,
Gibsonburg, Woodville, O., \$12.25;
Thornton, McCook, Ill., \$12.35;
Dolly Siding, Bonne Terre, Mo.,
\$12.45.

Ores

Lake Superior Iron Ore
Gross ton, 51 1/2% (natural)
Lower Lake Ports(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)
Old range bessemer

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS		H. R. Alloy 4140§	Standard Structural Shapes	PLATES	
	H. R. 18 Ga. and Heavier*	C. R. 15 Ga.	Galv. 10 Ga.†	H. R.*	C. R.*	H. R. Rds.	C. F. Rds.			Carbon	Floor
New York (city)	6.00‡	6.51	7.15	5.82	...	5.77	6.56	8.68	5.53	5.90	7.36
New York (c'try)	5.80‡	6.31	6.95	5.62	...	5.57	6.36	8.48	5.33	5.70	7.16
oston (city) ..	6.10‡	6.70**	7.16	5.80	...	5.67	6.42	8.72	5.57	5.95	7.40
oston (c'try) ..	5.95‡	6.55**	7.01	5.65	...	5.52	6.27	8.57	5.42	5.80	7.25
hila. (city)...	5.80	6.39	6.73	5.55	...	5.55	6.09	8.00	5.25	5.50	6.70
hila. (c'try)...	5.65	6.24	6.58	5.40	...	5.40	5.94	7.85	5.10	5.35	6.55
alt. (city)...	5.46	6.36	7.06	5.52	...	5.57	6.31	...	5.51	5.71	7.16
alt. (c'try)...	5.31	6.21	6.91	5.37	...	5.42	6.16	...	5.36	5.66	7.01
orfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
ash. (w'hse) ..	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
uffalo (del.) ..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
uffalo (w'hse) ..	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
itts. (w'hse) ..	4.85	5.754*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05-5.10	6.55
etroit (w'hse) ..	5.32	6.224*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.43	5.67	7.02
leveland (del.) ..	5.00	5.90	6.80-6.91	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
leve. (w'hse) ..	4.85	5.75	6.65-6.76	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
ncin. (w'hse) ..	5.26‡	5.94**	6.83	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
hicago (city) ..	5.00-5.20‡	5.90‡	6.95	5.00	6.67-6.83	5.05	5.60	7.85‡	5.05	5.25	6.70
hicago (w'hse) ..	4.85-5.05‡	5.75‡	6.80	4.85	6.52-6.68	4.90	5.40	7.70‡	4.90	5.10	6.55
ilwaukee (city) ..	5.18-5.38‡	6.08‡	7.13	5.18	6.82-7.01	5.23	5.78	8.03‡	5.23	5.43	6.88
t. Louis (del.) ..	5.37	6.27‡	7.44	5.34	6.64	5.39	6.19‡	6.64	5.39	5.59	7.04
t. L. (w'hse) ..	5.22	6.12‡	7.29	5.19	6.49	5.24	6.04‡	6.49	5.24	5.44	6.89
irmingham (city) ..	5.15	6.15	6.55	5.15	...	5.15	6.83	...	5.15	5.30	7.62
irmingham (c'try) ..	5.00	6.00	6.40	5.00	...	5.00	6.68	...	5.00	5.15	7.47
Omaha, Nebr. ..	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city) ..	6.60	8.05**	7.95	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse) ..	6.45	7.90**	7.80	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco ..	6.15‡	7.50‡	8.10	6.75‡	8.25‡	5.90‡	7.55	10.85‡	5.90	6.35	8.10
Seattle-Tacoma ..	6.70‡	9.15‡	8.80	6.70‡	...	6.20‡	8.15‡	10.35	6.30‡	6.35‡	8.40‡

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 17 gage; †† as annealed.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; 1—1500 lb and over; 2—1000 to 4999 lb; 3—450 to 1499 lb; 4—400 to 1499 lb; 5—1000 to 1999 lb; 6—1000 lb and over; 7—300 to 9999 lb; 8—1500 to 1999 lb; 9—400 to 3999 lb; 10—400 lb and over; 11—500 to 1499 lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegelisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, \$65, Palmerton, Pa.; \$66, Pittsburgh and Chicago; (16% to 19% Mn) \$1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk, \$172 per gross ton of alloy, c.l. packed, \$184; gross ton lots, packed, \$199; less gross ton lots, packed, \$216; f.o.b. Alloy, W. Va. Niagara Falls, N. Y., or Welland, Ont. Base price: \$174, f.o.b. Birmingham and Johnstown, Pa., furnaces; \$172, Sheridan, Pa.; \$175, Ethna, Pa. Shipment from Pacific Coast warehouses by one seller add \$33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, \$214; less gross ton lots, \$231 f.o.b. Chicago. Add or subtract \$2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. Special Grade: (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 27" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi. Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed

21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.08% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.35c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, \$1.03 per lb of contained chromium, ton lot \$1.05, less ton \$1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lot 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices. 75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

86-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload

packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices. 90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.) C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsilfer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr.) Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn.) Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.65c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3% lb and containing exactly 2 lb of Mn and approx. ¼ lb of Si.) Contract, c.l. bulk 10.80c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si.) Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.85c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si.) Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdenic-Oxide Briquets: (Containing 2½ lb of Mo each, 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

(Please turn to Page 150)

Copper and Lead Sales Increase

Volume of inquiry equals or exceeds custom smelters' daily intake which has been cut by light receipts of scrap at low prices. Zinc remains unchanged on light demand

New York—Better balance between supply and demand for major non-ferrous metals has been achieved. This has been brought about by an increase in buying, especially of lead and copper at the 11.35-cent and 16-cent respective price levels, coupled with widespread curtailment of metal mining due to relatively low prices and labor difficulties. Zinc held last week at 9.00c, East St. Louis.

Undertone of the metal markets has been strengthened by the government's stockpiling program. During the last week of the fiscal year, \$40 million were available for purchases of strategic minerals and metals and, while no actual figures are available, it is understood that large tonnages of lead were bought. The second deficiency bill also provided \$270 million for contractual purchase agree-

Zinc—Large consumers are gradually re-entering the market, although demand has not increased as greatly as that for copper and lead. With production cut by more than 50 per cent in the Tri-State district due to low prices and with operations curtailed elsewhere due to labor difficulties, available supply has been reduced sharply. This will have an important bearing on prices as soon as the expected pickup in demand materializes.

Eagle-Picher Mining & Smelting Co. suspended all mine-mill operations in the Tri-State district Thursday night, leaving only two major producers continuing operations in that district.

Tin—May exports of tin concentrates from Bolivia were the equivalent of 2370 tons of fine tin, representing a drop of 477 tons from the previous month's figure. Due to a strike at the mines, the June total is expected to drop below the 2000-ton figure. Under government control here, prices held unchanged at \$1.03, New York, for Straits.

Metal Price Averages For June

(cents per pound)

Electrolytic Copper, del.	
Conn.	16.606
Lead, St. Louis	11.850
Prime, Western Zinc,	
E. St. Louis	9.548
Straits Tin, New York	103.000
Primary Aluminum	
Ingots, del.	17.000
Antimony, f.o.b. Laredo,	
Tex.	38.500
Nickel, f.o.b. refinery ..	40.000
Silver, New York	71.500

ments which allow the government to make contracts for strategic metals and minerals for shipment over an extended period.

At the same time, the Post Office Appropriations bill, now before Congress, provides \$525 million for stockpile acquisitions in the new fiscal year which started July 1. It also carries an appropriation of about \$270 million for future contractual agreements.

Copper—For the first time in many weeks, custom smelters were unable to meet consumers' demands fully. This is due in part to the slow movement of scrap, although prices on most grades rose fractionally last week. Some members of the trade believe electrolytic may advance from the present 16-cent level as soon as buyers enter the market more actively for forward needs.

Lead—Sales by custom smelters last week were generally sufficient to cover daily intake of ores, concentrates and scrap. With the undertone of the market firm, an additional strengthening factor is expected soon when the government enters the market for lead to be delivered in the third quarter for stockpiling purposes. These purchases may account for 30 per cent or more of total domestic output during that period.

The Fairmont City plant has been in operation for the past 35 years, and it has been one of the major zinc producing units east of the Mississippi river. It is one of the four slab zinc producing units being operated by the American Zinc Co.

The company normally produces between 10 per cent and 12½ per cent of the total domestic production of slab zinc. The Fairmont City unit represents approximately 17½ per cent of the company's smelting capacity.

Galvanized Sheet Needs Revised

Washington—Expansion in demand for grain storage bins, under stimulus of the new loan program of the Commodity Credit Corp. to assist farmers in financing such facilities, is not as great as was first envisioned. Office of Industry Cooperation has arranged so far with galvanized sheet producers to furnish around 18,000 tons a month through September, which represents an increase of about 10,000 tons a month over the previous allocations program. First estimates were that the expanded grain storage bin needs would call for a total of 28,000 tons of galvanized sheets monthly. Chances are that if tonnage in addition to that already promised by the mills is required, it will not be more than a few thousand tons monthly. Net effect is that supply of galvanized sheets for miscellaneous uses will not be as tight during the next three months as had been feared.

Lifts Aluminum Export Quotas

Washington—Export quota restrictions have been removed from aluminum plate, sheet and strip for the third and fourth quarters of 1949 by the Office of International Trade because of general improvement in supply. This action supersedes that of May 13, when OIT announced that third-quarter export quotas for these items would be 15,000 short tons.

Exporters must continue, however, to secure validated licenses covering shipments of these items and must observe all other applicable export control regulations.

Large Zinc Furnaces Cooled

St. Louis—American Zinc Co. of Illinois has pulled the fires from the Hegeler roaster kiln and from all of the company-owned retort zinc furnaces at its Fairmont City, Ill., plant. This means the permanent elimination of approximately 450 jobs, as it is impossible to restore these units after they have cooled. This action was taken in line with the previous announcement made by the company that it would pull the fires at its furnaces unless a union which had complied with the law in respect of the filing of noncommunist affidavits and which represented a majority of its employees was ready to bargain collectively by this date.

The company had at great expense kept all of these units under constant fire since the strike was called by the leadership of the International Union of Mine, Mill and Smelter Workers on Aug. 13, 1948. The company reached the decision to pull the fires with great reluctance, according to Howard I. Young, president.

Northwest Mines May Close

Seattle—Reports from lead and zinc operations in Washington, Idaho and Montana indicate that mine owners are worried over the decline in metal prices. Some mines may be forced to close. It is particularly serious for Idaho which last year produced \$22.8 million in zinc, \$31 million in lead. Wage negotiations are in progress in the Coeur d'Alene district. Owners are trying to reach an agreement basing wages on prices of metals.

New Park Mining Co., Park Utah Consolidated Mining Co. and Silver King Coalition Mines Co. halted operations because of a breakdown in negotiations with the unions.

Revere To Roll Aluminum Strip

New York—Magnesium-Aluminum Division, Revere Copper & Brass Inc., Baltimore, Md., will start rolling strip aluminum on a full-time production basis beginning in August. C. Donald Dallas, chairman of the board, announced last week.

Heretofore, Revere has limited its aluminum mill activities to the production of tube, forgings and extruded shapes. The latter have been produced commercially by Revere since 1922. Commenting on the new plans, Irving T. Bennett, vice president in charge of Revere's Magnesium-Aluminum Division, said:

"At the start we shall roll alloys 2S, 3S, 4S and 52S in widths up to 24 inches and in thicknesses of 0.037 in. and less. Of particular interest to those who prefer to set up for long runs, coils can be supplied weighing up to 70 pounds per inch of width."

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 16.00c, Conn. Valley; Lake, Nom., Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 14.25-15.50c; 88-10-2 (No. 215) 23.50c; 80-10-10 (No. 305) 20.00c; No. 1 yellow (No. 405) 12.00-13.25c.

Zinc: Prime western 9.00c, brass special 9.25c, intermediate 9.50c, East St. Louis; high grade 10.00c, delivered.

Lead: Common 11.85c; chemical, nom.; cor-rod- ing, 11.95c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 15.50-15.75c; No. 12 foundry alloy (No. 2 grade) 14.25-14.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 15.50-15.75c; grade 2, 14.50-14.75c; grade 3, 13.50-13.75c; grade 4, 12.50-12.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddy- stone, Pa.

Magnesium: Commercially pure (99.8%) stand- ard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) \$1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, \$1.028; grade C, 99.65-99.79%, incl., \$1.024; 99.5-99.64% \$1.024, grade F, 99.88-99.99% \$1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impuri- ties, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York \$80-83 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, \$24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, \$2 del.; special or patented shapes, \$2.15.

Cobalt: 97-98%, \$1.80 per lb for 550 lb (keg); \$1.82 per lb for 100 lb (case); \$1.87 per lb under 100 lb.

Gold: U. S. Treasury, \$35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: \$69-72 per ounce.

Palladium: \$24 per troy ounce.

Iridium: \$100-\$110 per troy ounce.

Titanium (sponge form): \$5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 29.68; yellow brass 26.77; com- mercial bronze, 95%, 29.68; 90%, 29.28; red brass, 85%, 28.36; 80%, 27.97; best quality, 27.56; nickel silver, 18%, 40.57; phosphor- bronze, grade A, 5%, 48.92.

Rods: Copper, hot rolled 25.53; cold drawn 27.78; yellow brass, free cutting, 21.34; com- mercial bronze, 95% 29.37; 90% 28.97; red brass 85% 28.05; 80% 27.66.

Seamless Tubing: Copper 29.72, yellow brass 29.78; commercial bronze 90% 31.94; red brass 85% 31.27; 80% 30.88.

Wire: Yellow brass 27.06; commercial bronze, 95% 29.97; 90% 29.57; red brass, 85% 28.65; 80% 28.26; best quality brass 27.85.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots, 21.80, l.c.l. 22.42½, c.l. 21.92½; weatherproof, f.o.b., eastern mills, 100,000 lb lots, 23.97½, l.c.l. 24.72½, c.l. 24.22½; magnet, delivered, c.l. 26.00, 15,000 lb or more 26.25, l.c.l. 26.75.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin
June Avg.	16.696	11.850	9.548	103.000
May Avg.	18.045	13.566	11.880	103.000
Apr. Avg.	21.774	15.017	14.085	103.000
June 1	17.625	11.85	11.00	103.00
June 2-7	17.625	11.85	10.75	103.00
June 8	17.000	11.85	10.00	103.00
June 9-11	17.000	11.85	9.50	103.00
June 13-14	16.500	11.85	9.50	103.00
June 15-16	16.500	11.85	9.00	103.00
June 17-30	16.000	11.85	9.00	103.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

ALUMINUM

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Diam. (in.) or distance across flats	Stock: 5000 lb and over.		
	Round— R317-T4, 17S-T4	Hexagonal— R317-T4 17S-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, \$17.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, \$17.00 per cwt. Traps and Bends: List price plus 45%.

ZINC

Sheets, 14.00c, f.o.b. mill, 36,000 lb and over, Ribbon zinc in coils, 13.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 12.00c; over 12-in., 13.00c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadel- phia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat un- trimmed 26.34c; oval 25.34c; cast 25.37c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, car- loads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c, f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Seward, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sew- aren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not ex- ceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 400 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 97.00c; 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals
BRASS MILL ALLOWANCES
Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean	Rod	Clean
	Heavy	Ends	Turnings
Copper	13.00	13.00	12.25
Yellow brass	10.50	10.25	9.62½
Commercial Bronze			
95%	12.12½	11.87½	11.37½
90%	11.87½	11.62½	11.12½
Red Brass			
85%	11.75	11.50	11.00
80%	11.50	11.25	10.75
Best Quality (71-80%)	11.50	11.25	10.75
Muntz Metal	9.75	9.50	9.00
Nickel, silver, 10%	12.62½	12.37½	6.31½
Phos. bronze, A....	14.87½	14.62½	13.62½
Naval brass	10.25	10.00	9.50
Manganese bronze	10.25	10.00	9.37½

BRASS INGOT MAKERS

BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 12.50, No. 2 copper 11.50, light copper 10.50, composition red brass 9.50, radiators 7.25-7.50, heavy yellow brass 7.00-7.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 12.50, No. 2 copper 11.50, light copper 10.50, refinery brass (60% copper), per dry copper content 9.50-9.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 10.00-10.50, No. 2 9.00-9.50, light cop- per 8.00-8.50, No. 1 composition red brass 7.75-8.00, No. 1 composition turnings 7.25-7.50, mixed brass turnings 4.50-5.00, new brass clippings 9.00-9.50; No. 1 brass rod turnings 7.00-7.25, light brass 5.00-5.25, heavy yellow brass 5.00-5.25, new brass rod ends 7.00-7.25, auto radiators, unsweated 5.50-5.75, cocks and faucets 6.75-7.00, brass pipe 7.00-7.25.

Lead: Heavy 7.50-8.00, battery plates 4.50-4.75, linotype and stereotype 10.25-10.50, electrotype 7.50-8.00, mixed babbitt 10.50-11.00, solder joints, 10.50-11.00.

Zinc: Old zinc 3.00-3.50, new die cast scrap 3.00-3.50, old die cast scrap 2.00.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00.

Aluminum: Clippings 28 9.50-10.00, old sheets 5.50-6.00, crankcase 5.50-6.00, borings and turnings 3.00-3.50, pistons, free of struts, 5.50-6.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

Cast Iron Grades		Cut Structurals	
		Elec. Furnace Bundles.	nominal 17.00
No. 1 Heavy Melt.	\$21.00	Cast Iron Grades	
No. 2 Heavy Melt.	19.00*	No. 1 Cupola Cast.	20.00-21.00
No. 1 Busheling.	21.00*	No. 1 Machinery.	21.00-22.00
No. 1 Bundles.	21.00*	Charging Box Cast.	18.00-18.50
No. 2 Bundles.	17.00-17.50*	Heavy Breakable.	18.00-18.50
No. 3 Bundles.	16.50-17.00*	Unstripped Motor Blocks	nom.
Heavy Turnings.	15.50-16.00*	Malleable.	nom.
Machine Shop Turnings	13.50-14.00†		
Mixed Borings, Turnings	13.50-14.00†		
Short Shovel Turnings.	17.50-18.00*		
Cast Iron Borings.	17.50-18.00		
Bar Crops and Plate.	21.00-21.50		
Low Phos. Steel.	23.00-23.50		

Cast Iron Grades†

No. 1 Cupola Cast.	22.00-22.50
No. 1 Machinery Cast.	27.00-27.50
Charging Box Cast.	21.00-21.50
Heavy Breakable Cast.	20.00-20.50
Brake Shoe.	21.00-21.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Axles.	25.00-26.00
Rails, Random Lengths	23.50-24.00†
Rails, 2 ft. and under.	26.50-27.00
Rails, 18 in. and under.	27.50-28.00
Railroad Specialties.	24.50-25.00*
Angles, Splice Bars.	24.00-24.50*

*Nominal.

†Brokers' buying prices.

‡Offering price.

CLEVELAND

Heavy Melt. Steel.	\$14.50-15.50
No. 1 Busheling.	14.50-15.50
No. 2 Bundles.	12.50-13.50
Machine Shop Turnings	8.50-9.50
Mixed Borings, Turnings	14.00-14.50
Short Shovel Turnings.	14.00-14.50
Cast Iron Borings.	14.00-14.50
Bar Crops and Plate.	16.00-17.00
Punchings & Plate Scrap	17.00-17.00
Cut Structurals.	17.00-18.00

Cast Iron Grades†

No. 1 Cupola.	23.50-24.50
Charging Box Cast.	18.50-19.50
Stove Plate.	17.50-18.50
Heavy Breakable Cast.	15.50-16.50
Unstripped Motor Blocks	14.50-15.50
Malleable.	17.50-18.50
Brake Shoes.	16.50-17.00
Clean Auto Cast.	26.50-27.00
No. 1 Wheels.	21.50-22.50
Burnt Cast.	14.50-15.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R.R. Malleable.	21.00-22.00
Rails, 3 ft. and under.	28.00-29.00
Rails, Random Lengths	24.00-25.00
Cast Steel.	24.00-25.00
Railroad Specialties.	24.00-25.00
Uncut Tires.	23.00
Angles, Splice Bars.	27.00

† Nominal.

VALLEY

Heavy Melt. Steel.	\$18.50
No. 1 Bundles.	18.50
No. 2 Bundles.	15.50
Machine Shop Turnings	10.00-10.50
Short Shovel Turnings.	15.00-15.50
Cast Iron Borings.	15.50-15.50
Low Phos.	19.50-20.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.50-21.00
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MANSFIELD

Machine Shop Turnings	\$10.00-10.50
Short Shovel Turnings.	14.00-14.50

CINCINNATI

No. 1 Heavy Melt. Steel	\$19.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling.	18.00
No. 1 Bundles.	19.00
No. 2 Bundles.	17.00
Machine Shop Turnings	8.00
Mixed Borings, Turnings	8.00
Short Shovel Turnings.	8.00
Cast Iron Borings.	9.00

Cast Iron Grades

No. 1 Cupola Cast.	27.00
Charging Box Cast.	21.00
Heavy Breakable Cast.	18.00
Stove Plate.	15.00
Unstripped Motor Blocks	15.00
Brake Shoes.	15.00
Clean Auto Cast.	27.00
Drop Broken Cast.	30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
R.R. Malleable.	17.00
Rails, Random Lengths	21.00
Rails, 3 ft. and under.	19.00
Rails, 18 in. and under	30.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Bundles.	\$14.50-15.00
No. 2 Bundles.	11.00-11.50
No. 2 Heavy Melt. Steel	11.00-12.00
No. 1 Busheling.	14.50-15.00
Machine Shop Turnings	8.00-8.50
Mixed Borings, Turnings	8.00-8.50
Short Shovel Turnings.	9.50-10.00
Cast Iron Borings.	9.50-10.00
Punchings & Plate Scrap	14.50-15.00

Cast Iron Grades

No. 1 Cupola Cast.	20.00-21.00
Heavy Breakable Cast.	16.00-17.00
Clean Auto Cast.	20.00-21.00

BUFFALO

No. 1 Heavy Melt. Steel	\$19.00-19.50
No. 2 Heavy Melt. Steel	17.00-17.50
No. 1 Bundles.	17.00-17.50
No. 1 Bushelings.	17.00-17.50
No. 2 Bundles.	15.00-15.50
Machine Shop Turnings	10.50-11.00
Mixed Borings, Turnings	10.50-11.00
Cast Iron Borings.	14.00-14.50
Short Shovelings.	14.00-14.50
Low Phos.	20.00-21.00

Cast Iron Grades

No. 1 Cupola.	22.00-23.00
Mixed Yard.	20.00-21.00
Heavy Breakable.	17.00-18.00
Malleable.	19.00-19.50
Clean Auto Cast.	22.00-22.50

Railroad scrap

Rails 3 ft. and under.	29.00-30.00
Scrap rails.	24.00-25.00
Specialties.	25.00-26.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	\$18.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling.	17.00
No. 1 Bundles.	18.00
No. 2 Bundles.	15.50
Machine Shop Turnings	11.00-11.50
Mixed Borings, Turnings	10.50-11.00
Short Shovel Turnings.	13.00-13.50
Bar Crop and Plate.	21.00-21.50
Punchings & Plate Scrap	22.00-22.50
Cut Structurals.	21.00-21.50
Elec. Furnace Bundles.	18.00
Heavy Turnings.	18.00
No. 1 Chemical Borings.	Nom.

Cast Iron Grades

No. 1 Cupola Cast.	25.00
No. 1 Machinery Cast.	27.00-28.00
Charging Box Cast.	23.00-24.00
Heavy Breakable Cast.	23.00-24.00
Unstripped Motor Blocks	19.00-20.00
Clean Auto Cast.	27.00-28.00
No. 1 Wheels.	27.00-28.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	\$12.50-13.00
No. 2 Heavy Melt. Steel	11.00
No. 1 Busheling.	11.00
No. 1 Bundles.	12.50-13.00
No. 2 Bundles.	10.00-10.50
No. 3 Bundles.	nominal
Machine Shop Turnings	5.00-7.00
Mixed Borings, Turnings	5.00-6.00
Short Shovel Turnings.	7.00-8.00
Punchings & Plate Scrap	17.00

Cut Structurals. nominal
Elec. Furnace Bundles. 17.00

Cast Iron Grades

No. 1 Cupola Cast.	20.00-21.00
No. 1 Machinery.	21.00-22.00
Charging Box Cast.	18.00-18.50
Heavy Breakable.	18.00-18.50
Unstripped Motor Blocks	nom.
Malleable.	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	\$13.00-13.50
No. 2 Heavy Melt. Steel	10.50-11.50
No. 1 Bundles.	12.00-13.00
No. 1 Busheling.	9.50-10.00
Machine Shop Turnings	5.00-5.50
Mixed Borings, Turnings	4.50-5.00
Short Shovel Turnings.	9.00-9.50
Bar Crops and Plate.	14.00-15.00
Punchings & Plate Scrap	14.00-15.00
Chemical Borings.	10.50-11.00

Cast Iron Grades

No. 1 Cupola Cast.	19.00-20.00
Mixed Cast.	18.00-19.00
Heavy Breakable Cast.	17.00-18.00
Stove Plate.	18.00-19.00
Unstripped Motor Blocks	16.00-17.00

CHICAGO

No. 1 Heavy Melt. Steel	\$19.00-20.00
No. 2 Heavy Melt. Steel	17.00-18.00
No. 1 Bundles.	19.00-20.00
No. 2 Bundles.	15.00-16.00
No. 3 Bundles.	12.00-13.00†
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	9.00-10.00
Short Shovel Turnings	13.00-14.00
Cast Iron Borings.	12.00-13.00
Bar Crops and Plate.	19.00-20.00†
Punchings.	19.00-20.00†
Elec. Furnace Bundles.	19.00-20.00†
Heavy Turnings.	17.00-18.00
Cut Structurals.	20.00-21.00

Cast Iron Grades†

No. 1 Cupola Cast.	27.00-28.00
Clean Auto Cast.	27.00-28.00
No. 1 Wheels.	27.00-28.00

Railroad Scrap

No. 1 R.R. Heavy Melt	20.00-21.00
Malleable.	22.00-23.00†
Rails, Random Lengths	27.00-28.00
Rails, 2 ft. and under.	28.00-29.00
Rails, 18 in. and under	29.00-30.00
Railroad Specialties.	23.00-24.00
Angles, Splice Bars.	23.00-24.00

† Nominal

ST. LOUIS

No. 1 Heavy Melt. Steel	\$18.00-19.00
No. 2 Heavy Melt. Steel	17.00-18.00
Machine Shop Turnings	9.00-11.00
Short Shovel Turnings.	9.00-11.00

Cast Iron Grades

No. 1 Cupola Cast.	24.00-25.00
Charging Box Cast.	20.00-22.00
Heavy Breakable Cast.	19.00-20.00
Brake Shoes.	21.00-22.00
Clean Auto Cast.	28.00-29.00
Burnt Cast.	20.00-21.00

Railroad Scrap

R. R. Malleable.	21.00-23.00
Rails, Random Lengths	25.00-26.00
Rails, 3 ft. and under.	21.00-22.00
Uncut Tires.	19.00-20.00
Angles, Splice Bars.	24.00-25.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	\$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling.	18.00
No. 2 Bundles.	16.00
No. 3 Bundles.	14.00
Machine Shop Turnings	14.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings.	15.00
Cast Iron Borings.	15.00
Bar Crops and Plate.	25.00-26.00
Cut Structurals.	25.00-26.00

Cast Iron Grades

No. 1 Cupola Cast.	33.00-34.00
Stove Plate.	30.00-31.00
No. 1 Wheels.	30.00-31.00

STEELMAKING SCRAP COMPOSITE

June 25, 1949.	\$20.17
June 18, 1949.	21.25
May 1949.	22.29
June 1948.	40.67
June 1944.	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R.R. Malleable.	nominal
Rails, Random Lengths	30.00-32.00
Rails, 3 ft. and under.	31.00-32.00
Angles and Splice Bars	31.00-32.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	\$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles.	16.00
Machine Shop Turnings	12.00

Cast Iron Grades

No. 1 Cupola Cast.	25.00-30.00
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Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels.	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	\$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Bushelings.	17.00
Nos. 1 & 2 Bundles.	15.00
No. 3 Bundles.	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	20.00
Cut Structurals.	20.00
Elec. Furnace Bundles.	25.00

Cast Iron Grades

No. 1 Cupola Cast.	23.00
Heavy Breakable Cast.	17.00
Stove Plate.	20.00
Unstripped Motor Blocks	20.00
Malleable.	23.00
Brake Shoes.	23.00
Clean Auto Cast.	20.00
No. 1 Wheels.	22.00

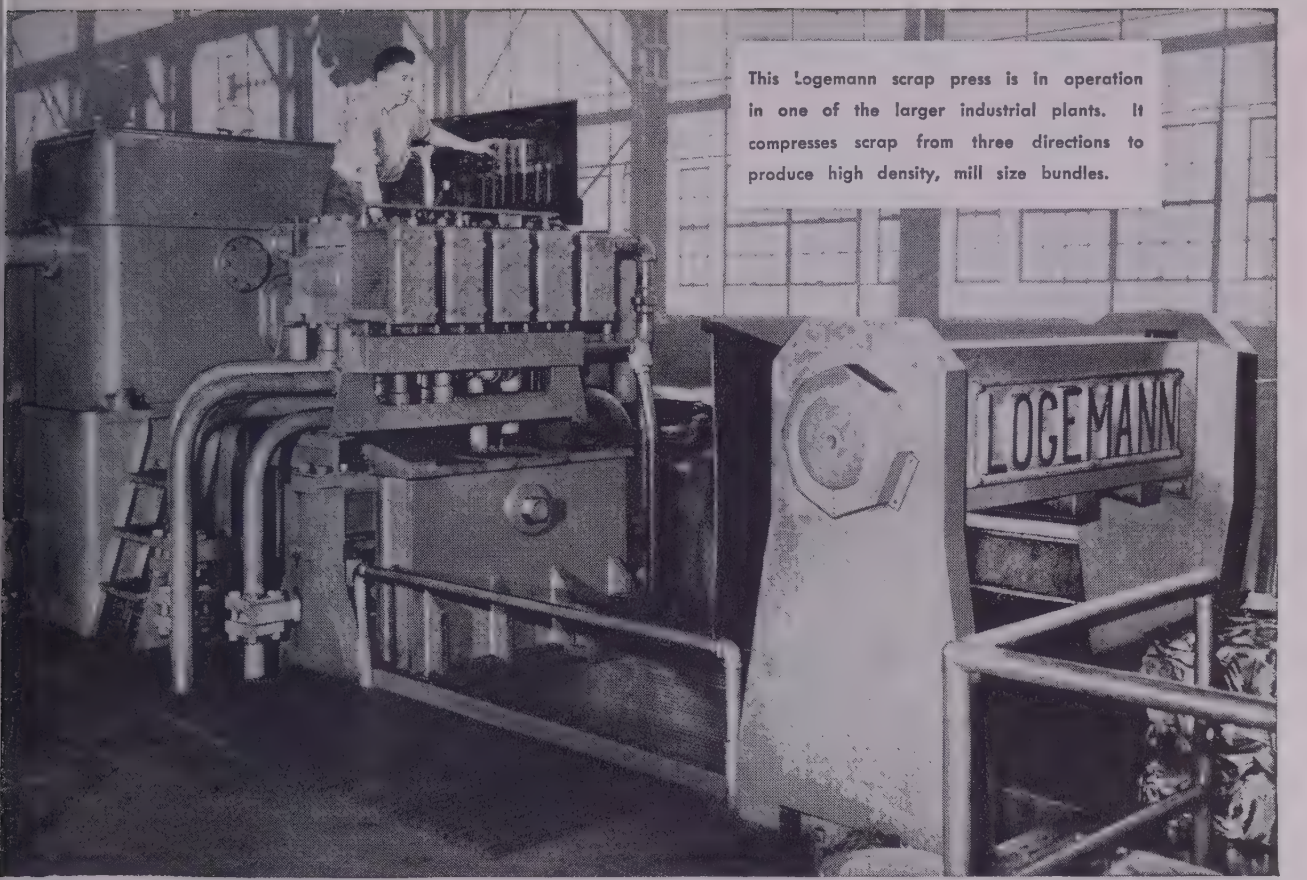
Railroad Scrap

No. 1 R.R. Heavy Melt.	18.00
Railroad Malleable.	22.00
Rails, Random Lengths	18.00
Angles and Splice Bars	18.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	\$20.00
No. 2 Heavy Melt. Steel	18.00



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-contained.....
Triple Compression..
Automatically Controlled } **LOGEMANN**
SCRAP PRESSES

handle high tonnages with minimum labor . . . at low cost!

●
LOGEMANN
METAL
BALERS

... are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

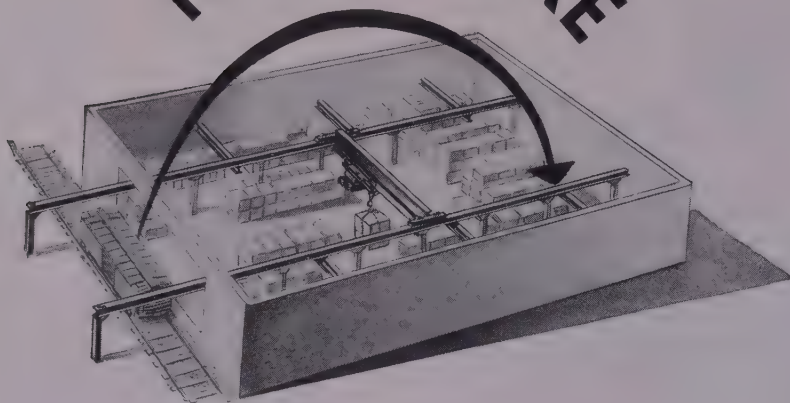
The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is no need for specially-trained maintenance crews.

Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information—please state the nature of your scrap and tonnage.

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3164 W. Burleigh Street ● Milwaukee 10, Wisconsin

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THROUGH THE AIR

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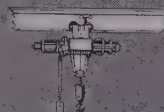
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SHEPARD NILES
CRANE AND HOIST CORPORATION

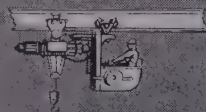
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HOISTS
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HOISTS
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Sheets, Strip . . .

Competition forces more sellers of cold-rolled strip to lower prices. Sheet demand lags

Sheet Prices, Page 126

Pittsburgh—Competitive conditions have forced many nonintegrated cold-rolled strip producers to reduce quotations. During period of supply shortage and high-priced conversion semifinished steel negotiations, many of these interests were forced to charge premium prices.

Flurry of order cancellations and hold-up of shipments of flat-rolled steel experienced throughout May and June have subsided and there is fair prospect of an improvement in new orders for replacement purposes. Producers are still making headway against order backlogs, with exception of galvanized sheets. Delivery promises are current on plain hot-rolled and silicon sheets with exception of transformer grade; some backlogs still are reported on cold-rolled, enameling and galvanized grades varying from 5 to 8 weeks. Automotive industry continues major factor in new sheet and strip orders.

Boston—Flat-rolled steel buying is confined to spot fill-in orders to plug gaps in inventories. A substantial part of limited demand is on delivery basis. While some mills are back in the New England market after having withdrawn in the postwar period, they have difficulty in re-establishing volume due to noncompetitive freight charges. While sheet schedules are filled for July, notably those of cold-rolled sheets, mill vacations will reduce substantially the total tonnage rolled.

New York—Sheet demand still lags, with mills fully caught up on orders for hot carbon sheets, but still behind on cold-rolled and galvanized sheets. Most producers have little galvanized tonnage to offer before September; in cold-rolled tonnage, before the middle of August. However, indications are they will be fairly caught up with demand on these products before the new quarter is over—certainly on cold finished. Vacation periods over the next couple of months will slow down production to some extent on these grades, but at the same time they also will slow down consumption. Supplies are fairly tight in enameling stock, but easy in electrical sheets and most other specialties, along with hot-rolled sheets.

Philadelphia—Coated products, particularly standard galvanized sheets, continue to be the most scarce of the light flat products, with some producers booked solidly through the next two months and into September. Government demand for speed in winding up the grain storage program, superimposed on general seasonal requirements, accounts primarily for the present stringency. However, this situation is expected to ease materially by the end of the quarter. Cold rolled sheets can still be had before the end of August, and hot rolled before the end of July. Harrisburg Steel Corp., Harrisburg, Pa., closed down June 27 for two weeks vacation.

Cincinnati—District sheet mills en-

ter the third quarter with virtually no carryover in marked contrast to previous conditions. The leading district interest is assured of capacity operations, except in a few specialties through July. Another mill, starting on the holiday, will be idle both in rolling and steelmaking for one week under a vacation plan. Galvanized and cold-rolled, as heretofore, are in tightest supply.


Chicago—Were it not for order backlogs and the carryover into the current quarter operations in this district would be far below the present rate. One major company admits that receipt of new orders at present is sufficient to guarantee a rate of only 65 per cent of capacity. Hopes are held that orders will pick up immediately after vacations in consumers' plants. Only product which most mills say is not easy to obtain is galvanized, although delivery on cold-rolled strip and sheets stretches beyond the overall average; other products vary widely in degree of easiness between different mills. Several district rolling mills will close for vacations this month, being able to satisfy customer requirements during the operating period. Bookings generally are full, however, for July, with August wide open on most products at most mills.

St. Louis—Cold-rolled sheet production came to a halt last week when a main motor at Granite City Steel Co.'s mill broke down. Repairs are expected to take two more weeks. The interruption, however, will have the benefit of pulling down coil inventories. Cold-rolled sheet demand is softening substantially, especially from the electrical appliance stove and refrigeration industries. In contrast to a year ago when they frequently brought full price, rejects cannot be sold now at any price. Demand for galvanized sheets shows no sign of weakness. Both makers and buyers of cold-rolled sheets expect the third quarter, rather than the fourth, to be the critical one. Indications now are that the fourth will be filled, but sales resistance is already showing up in third quarter, plus cancellations among those already placed.

Birmingham—Mill sources here indicate sheets maintain about the usual balance as between supply and demand which means that bookings generally are approximately a quarter ahead. There may be some slight edge in bookings over supply in the matter of sheets, however, which for several years have been one of the district's most critical items. A fair volume of strip is being rolled, most of it in cotton ties and barrel strips.

Los Angeles—Inquiries for sheet and strip have increased, but buying is "close to the vest." Customers are shopping around, both on price and delivery. Mills are quoting from 1 to 8 weeks' delivery on flat-rolled products. Light gage galvanized, however, still is in short supply and remains on a semiallocation basis.

San Francisco—Sheet buying continues cautious, with few future orders being placed. Hand-to-mouth demand now is less than the supply for most flat-rolled products, with the exception of galvanized sheets. That item, however, barely qualifies as a "scarce" product and within weeks it should be in easy supply.



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Steel Bars . . .

Deliveries now range from two to six weeks. Automotive needs bolster market

Bar Prices, Page 126

Philadelphia—With various shops going down for a week to two weeks for vacations, pressure for hot carbon bars is at the lowest point in years. However, some betterment is anticipated in August which will extend into the fall, although no sharp improvement at least for some weeks. Meanwhile, barmakers are offering shipments before the end of the month on most specifications, much depending upon rolling cycles. Cold drawn carbon bar sellers can make shipment within two to three weeks on about 85 per cent of the specifications required.

Boston—Users of carbon bars have been consuming more tonnage than they have been receiving and have placed scattered fill-in orders, indicating that inventories are being worked down. On the whole, demand lags, notably for cold-finished and alloys. Some upturn is looked for in August from industrial consumers, but warehouses have placed a minimum third quarter business.

New York—Hot carbon bar deliveries are easy, with some sellers able to offer shipments on some sizes within a period of two weeks, much depending upon the cycle of operations. Broadly speaking, most producers can handle any size for shipment within a month, or by early August at the outside. Large rounds are perhaps the most extended, so far as deliveries are concerned. The situation would be still easier at some plants were it not for suspensions for vacations.

Cold-drawn bars also are in easy supply, as sellers continue to build up inventories. Meanwhile, alloy bars can be had within three weeks and less.

Pittsburgh—Sellers of cold-finished carbon bars have reduced operations moderately in recent weeks, reflecting relatively large mill stocks and dearth of new orders. Demand for screw machine stock is particularly low; automotive requirements continue to bolster the market. Sellers report a leveling off in order cancellations and holdup of mill shipments, indicating many consumers have reduced inventories to more realistic levels. Consumers are no longer unloading excessive inventories on the market at below mill prices, a condition which has been of serious concern among producers in recent weeks. Many cold-finished bar items are available from stock, while mill order requirements for standard items take only two to four weeks for delivery. This is in sharp contrast with the seven to ten weeks' delivery time required at the start of the second quarter. Hot-rolled carbon bars are available from mills within four to five weeks.

Los Angeles—Pacific States Steel Corp., producer of angles, rounds, flats, reinforcing, and small shapes, reports demand is holding up well enough to warrant capacity operation of the new 26-inch mill at its Niles, Calif., plant. Company is equalizing on freight into the Los Angeles area.

Plates . . .

Plate Prices, Page 127

Philadelphia—While tonnage is developing slowly, plate sellers are called upon to do quite a little figuring as consumers are more disposed to shop around than heretofore. Many inquiries are tentative and involve small tonnages, but the situation points to the fact that fabricators are digging hard for business and in setting up their estimates are making sure they are getting the best possible price and delivery. However, there have been no changes in prices recently. As for shipments, buyers have little difficulty in obtaining promises of three to four weeks despite the fact that one district producer has just wound up a two weeks' suspension on the smaller of its two finishing mills, that another will be down for the greater part of the first two weeks of this month and that still another will be down for two weeks beginning July 11. These suspensions provide for vacations and repairs. Plate sellers are competing more keenly for such export business as is being offered, although 4.25c, f.a.s., still appears to be the going market. Most export inquiry for plates is from Holland, Norway and Sweden, mostly for ship work. Meanwhile, the Maritime Commission is taking bids on a 20,000-ton luxury liner, to be operated by the Mississippi Shipping Co. Inc., New Orleans.

Boston—Consumers of plates are placing a minimum of forward volume, buying in small lots as needed. Usually delivery is the prime factor and best shipping date frequently lands the order. Selling is keenly competitive with mill prices leveling off. Pittsburgh district mills are confronted with freight disadvantages under present f.o.b. selling.

New York—Plate consumers continue to buy lightly, drawing upon inventories wherever possible. In various important lines, operations are so light consumers can coast along for the present without having to enter the market for much new tonnage. At the same time, however, there are indications that in some cases they have waited too long for needed replacements, for, when they do enter the market, they urge shipments within two to three weeks and consequently not infrequently have to shop around to get such shipments. As a matter of fact, certain requests for prompt shipment apparently can't be met by anyone, especially now with some of the mills taking time off for vacations.

Rails, Cars . . .

Track Material Prices, Page 127

New York — Railroad equipment buying is featured by the award of 146 diesel-electric locomotive units by the Chesapeake & Ohio Railroad; car buying includes 200 box cars for New York, Chicago & St. Louis, the largest list to have been placed in almost a month.

The Pennsylvania and affiliated lines closed bids June 29 on contract 62-1949 for frogs, switches, switch points, switch rails and miscellaneous track materials.



a full line . . . PRODUCTION MACHINERY

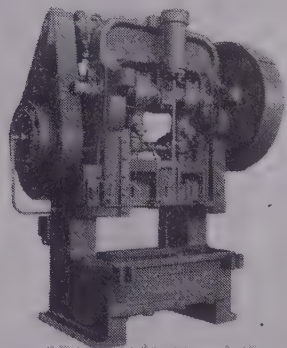


FORGING
No. 24 BULLDOZER . . . Capacity, 80 tons; Stroke, 18 in.; Strokes per min., 10; Frame, cast semi-steel.

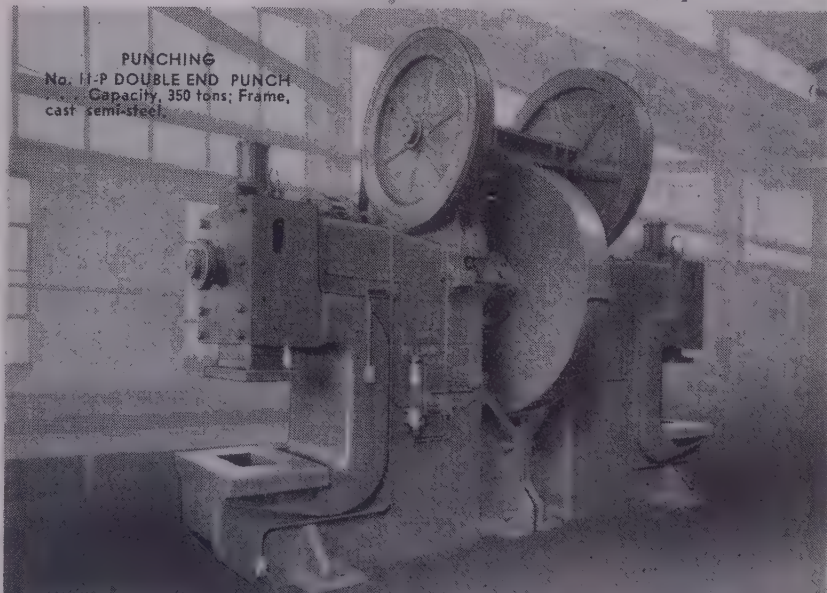


BENDING
No. 22 EYEBENDER . . . Capacity 1½" round bar hot on 2" mandrel; ¾" round bar cold on 1¼" mandrel. 12 S.P.M.

The machines shown here are typical of the equipment built by WILLIAMS-WHITE to meet the particular needs of industry. If you are interested in machines similar to the ones illustrated, write us giving as much information as possible and we will send complete specifications.



FORMING
No. 6 G-48 GAP FRAME PRESS . . . Capacity, 125 tons; Strokes per min., 35; Frame, semi-steel casting.



PUNCHING
No. 11-P DOUBLE END PUNCH . . . Capacity, 350 tons; Frame, cast semi-steel.

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JOHNSON No. 1019 SOFT METAL FURNACE

\$312⁰⁰

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for heavy-duty melting • Save time and gas in melting large quantities of lead, tin, zinc, pot metal, type metal, aluminum, etc. Nine powerful Johnson direct jet burners deliver pot temperatures up to 1400° F. for fast melting. Assures quick recovery after reloading. Each burner has separate shut-off valve and pilot light permitting use of only as many burners as needed to maintain melting temperature. Heavily insulated to reduce heat loss. Complete with removable cast iron pot and lifting hooks.

Quick Acting JOHNSON No. 120 HEAT TREATING FURNACE

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Tin Plate . . .

Tin Plate Prices, Page 127

Pittsburgh—Electrolytic tin plate production schedules are filled through August and sellers do not anticipate much trouble in lining up full operations through remainder of third quarter. The situation is quite different in hot-dipped tin plate demand with schedules past July uncertain at this time.

Easing in regulations under order M-81 has stimulated demand for electrolytic. Normally output of electrolytic represents about 50 per cent of the total tin plate produced. However, this relationship is expected to be altered in the third quarter with electrolytic perhaps 60 per cent of the total tin plate output. Tin plate consumers continue to be inventory conscious and are ordering only on basis of actual needs. This condition has been accentuated further by belief within the trade of pending lower prices. However, tin plate sellers contend that there will be no price reductions this year and will make no predictions as to price levels for 1950. Export demand continues weak, due in part to dollar shortages and general easing in requirements.

Wire . . .

Wire Prices, Page 127

Chicago—Inventory reduction is going too far with some wire consumers. Believing that steel will be immediately forthcoming from mills when needed, one company last week was understood to have lost an order because of inability to fill it promptly. Stocks with this concern had declined to three to four days' supply. To protect themselves from this and also a hedge against a possible steel strike a few companies are requesting that their suppliers maintain stocks for at least 30 days' requirements, guaranteeing reimbursement to the suppliers in case of a price decline and resulting inventory loss. On the whole demand is down sharply and wire drawing operations are considerably curtailed in the district. Most interests believe this to be temporary, being caused by inventory caution, and expect buying to pick up in September. New stainless wire mill at Waukegan, operated by American Steel & Wire Co., has capacity far in excess of present demand, but officials believe that new uses will continually be developed and stainless wire consumption will expand as a result.

Boston—Volume of business deferred from second quarter is expected to be released on a heavier scale in August, with July marked as a low production and consumption month. Most wire mills are down for vacations and, in the case of the largest producer, includes the open-hearth department. Wire consumers processing products for the automotive industry are maintaining requirements at a higher rate than the average wire former, including fastener producers. Screw demand, however, is off generally with considerable volume deferred.

Pittsburgh—Jobbers' stocks of merchant trade wire items are largest and in better balance than at any time in postwar period. Seasonal

demand has not developed as expected with result mill purchases are restricted to actual needs. Producers are offering fence and barbed wire on 2 to 3 week delivery basis. Requirements for nails in small size classifications have held up fairly well with mill deliveries extended 3 to 4 weeks; some large sizes are available from stock. Improvement is noted in demand for spring wire from bedding and furniture manufacturers reflecting completion of inventory adjustment to realistic levels. Low-carbon spring wire is available within 2 to 5 weeks; high carbon, 1 to 4 weeks. Production of wire items during July will be adversely affected by scheduled plant vacation periods.

Birmingham — A steady but not nearly so spectacular demand for wire products is noted in this district. Farm requirements have picked up considerably in the last few weeks and would be even more active except for continued rains. Nails and woven wire are moving in especially satisfactory volume.

Tubular Goods . . .

Tubular Goods Prices, Page 127

Pittsburgh—Distribution of standard pipe and oil country goods remains under strict mill allotment, although jobbers' inventories have been augmented substantially in recent weeks with result pressure on mills for prompt deliveries has eased considerably. As in other products, conversion deals for pipe have been discontinued except in isolated instances. While demand for tubular products continues heavy, few complaints have been reported of inability to obtain essential requirements. Drop in zinc quotations with resultant lower galvanized product quotations has prompted jobbers to keep inventories of this item to a minimum. Substantial decline in demand for pressure tubing over recent weeks has placed this item on same delivery basis of mechanical tubing; namely 1 to 2 weeks for smaller sizes, 3 to 4 weeks for large sizes.

St. Louis—Pipe, in diameters $\frac{1}{2}$ to 2 inches, continues to be the strongest item in the steel picture here. Third quarter books are filled and the outlook for the fourth remains good.

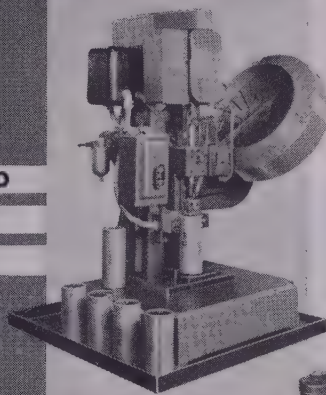
Seattle—With materials available in normal tonnages and deliveries within 60 days, cast iron pipe agencies report no interest in their products. No sizable projects are up for figures.

Los Angeles — Pipe requirements have leveled off, but deliveries still are slow on diameters of $\frac{1}{2}$ -in. to $1\frac{1}{4}$ in., which are used primarily for residential construction and are in good demand. Fabrication of large pipe for oil and gas lines continues active, although the peak apparently has been passed in new foreign business. Domestic requirements in the West are heavy.

San Francisco—Standard Oil Co. of California has announced plans to build a pipeline from Salt Lake City to Spokane, Wash. Cost of the line will be about \$6.5 million, and it will serve the western Washington area from Standard's new \$5 million refinery at Salt Lake City, Utah.

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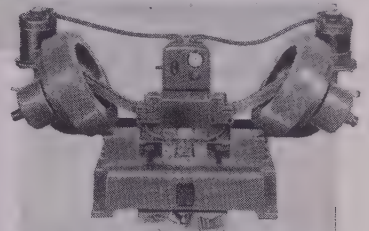


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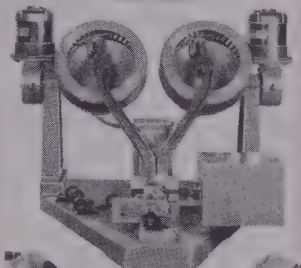
Pressing terminal studs in dry cell batteries.

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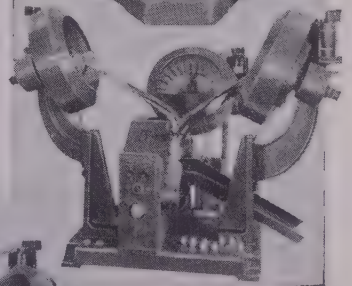
Assembling small hardware hinges by inserting two hinge pins simultaneously.



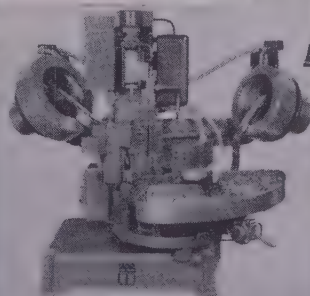
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Structural Shapes . . .

Structural Shape Prices, Page 127

Boston—Bridge contracts, approximating 3000 tons, account for a temporary bulge in fabricated structural steel activity. Low per pound on a 2400-ton steel arch superstructure, Gloucester, Mass., was 19.35 cents by Bethlehem Steel Co. A 430-ton span, Maine, went to Lackawanna Steel Construction Co., Buffalo. New inquiry is light with plain material more plentiful for prompt delivery; mills are stocking a broader range of sizes. One producer will soon start rolling wide flanged material, up to 24-inch, at Buffalo, also steel sheet piling. Delivery promises

on some contracts held by district shops are endangered by labor troubles which set back fabricating schedules.

New York—Structural bookings in May of 115,903 tons represented an increase of 17.5 per cent over the preceding month, according to the American Institute of Steel Construction Inc. April bookings as revised were 98,629 tons. Bookings for the first five months totaled 602,793 tons, about 25 per cent less than in the corresponding months in 1948, but 6 per cent more than the average bookings for the same months in the five pre-war years, 1936-1940.

May shipments amounted to 167,976 tons as compared with a revised total of 179,056 tons in April. Ship-

ments for the first five months totaled 831,542 tons, against 808,550 tons in the same period of last year.

Backlogs for the next four months only, amounted to 599,499 tons, as of June 1.

Philadelphia — District fabricators report a continued shrinkage in backlogs with a general average of three months business on hand bolstered principally by public work. Standard shapes continue in easy supply at about three to four weeks, with deliveries on wide flange sections somewhat more extended. At least one producer is promising shipments on the latter in six to seven weeks.

Pittsburgh—Structural fabricators are ordering to more exacting size specifications now that mills are in a position to supply standard structural shapes and wide flange beams within relatively short delivery range of four to five weeks. Such action is expected to enable fabricators to realize considerable economies because of elimination of cutting sections for required lengths, etc. New inquiries for private jobs have recorded little improvement recently.

With few exceptions, bulk of new work represents public construction. One such exception is the 39-story Mellon-U. S. Steel office building at Pittsburgh, scheduled to be completed in spring of 1951. Turner Construction Co., New York, has been awarded general contract, while American Bridge Co. has received contract for structural steel totaling 14,000 tons.

San Francisco—Demand for structural items is still lagging. Low demand has affected some mill operations adversely. A declining trend in building costs leads some observers to hope for a pick-up in buying soon. Most projects now are public works or state construction jobs.

Seattle—Fabricating plants report a continued good volume in small jobs of less than 100 tons each. Materials are now in ample supply. Order backlogs will carry into the fourth quarter.

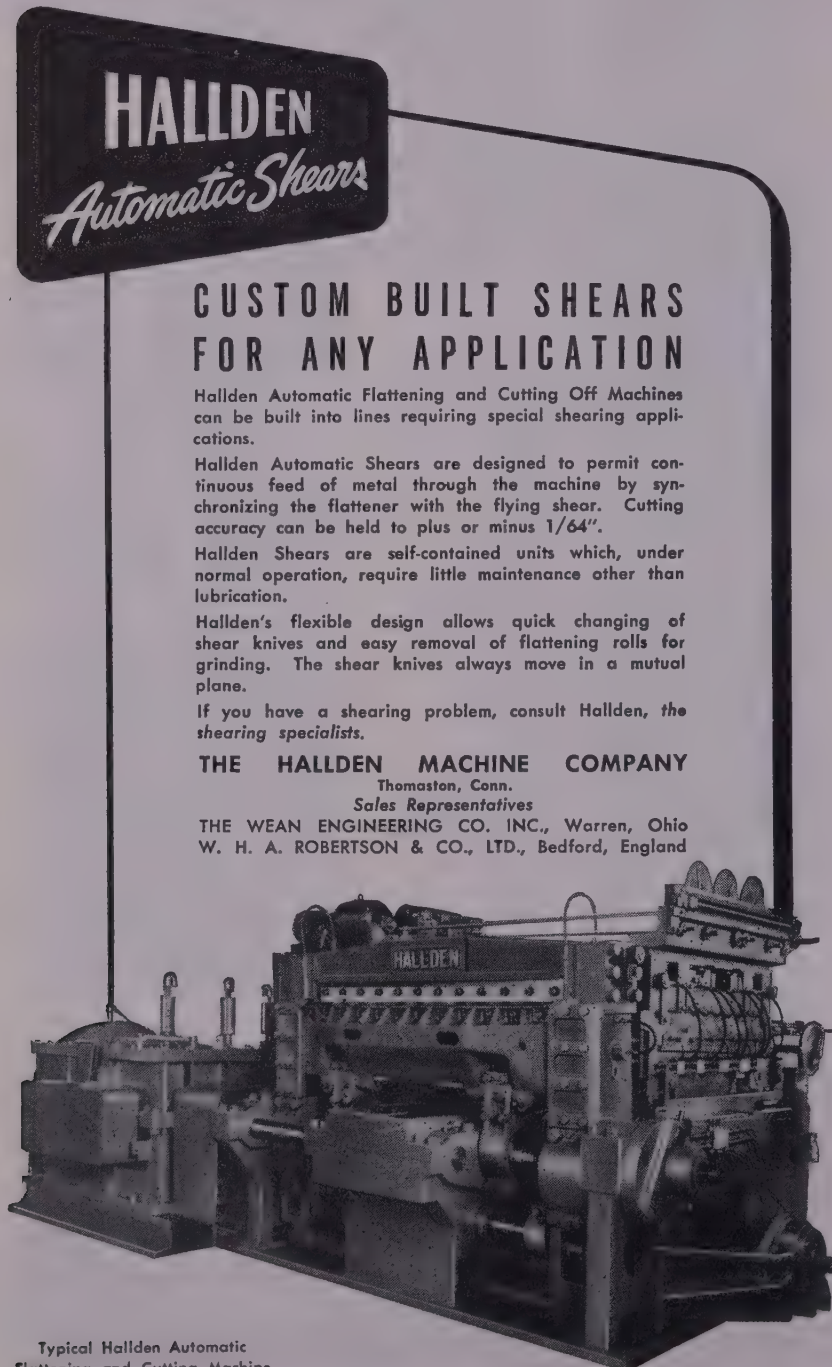
Reinforcing Bars . . .

Reinforcing Bar Prices, Page 126

Los Angeles — Jobber buying and requirements of large construction projects are sustaining demand for reinforcing bars at a comparatively good level. Engineering construction awards during May in Southern California, southern Nevada, and Arizona, totaled \$31,209,000, highest for any month in the past ten years. This compares with \$18,268,000 in April, and \$13,636,000 in May, 1948.

Large contracts awarded last month included three aqueduct tunnels and surge chambers for the Los Angeles Department of Water and Power, \$8,948,000; aeration and settling system for Los Angeles Hyperion sewage plant, \$6,170,000; and water filtration plant for City of San Diego, \$2,233,000.

Seattle—Operations are completely down at plant of Northwest Steel Rolling Mills Inc., due to labor difficulties and it is not likely this controversy will be settled until the larger national producers set the wage pattern for the industry in contracts now under negotiation. Local plant of Bethlehem Pacific Coast Steel Co. is running at capacity.



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Pig Iron . . .

Pig Iron Prices, Page 128

Pittsburgh—Slight improvement in pig iron demand is noted among smaller foundries, reflecting better balanced inventories of finished castings. June bookings for merchant iron were moderately larger than those in May. However, outlook for July indicates a recession from last month's level primarily because of wide scale vacations within the foundry trade.

Pittsburgh Coke & Chemical Co. plans to fulfill its pig iron contract commitment with General Motors Corp. from its Neville Island blast furnace. Originally, this iron was expected to be supplied from the company's Struthers, O., furnace, but sharp drop in merchant pig iron demand has made it possible to ship from Neville Island with resultant saving of about \$2.50 a ton freight charges on cost of shipping the coke from Neville Island to Struthers. The Neville Island furnace previously was scheduled to be blown out for repairs sometime during July. However, the furnace now will stay in operation, but should it be necessary to blow it out for relining, the company has accumulated ample inventories to meet present commitments.

Carnegie-Illinois Steel Corp. banked its No. 5 furnace at Duquesne Works June 28, reflecting further decline in pig iron requirements. There are now only 35 out of 47 units pouring iron in the Pittsburgh district.

Shenango Furnace Co. has blown out one of its two blast furnaces at Sharpsville and banked the other for the Fourth of July weekend.

Boston—Reduction of \$2.50 a ton to \$50, Everett, Mass., by the Mystic Iron Works is not likely to stimulate shipments over the next few weeks. Iron consumers are more concerned over reducing inventories than they are in price levels, as they have been for some months. Foundry melt is down to a new postwar low with the same being true of basic melters. One Buffalo producer has moved a limited tonnage of iron to Beacon, N. Y., for trans-rail shipment into New England, thereby returning to a prewar custom.

New York—With many foundries now down for mass vacations for a week to two weeks, pig iron shipments are at the slowest rate in recent years. The practice of taking mass vacations has greatly increased with more foundries down this year than ever before, a situation ascribed in part to the lull in demand for castings. Most pig iron sellers contemplate a rather listless situation throughout the entire summer.

Buffalo—Foundry operations received a further jolt here when the American Radiator & Standard Sanitary Corp. halted production for an indefinite period at its Bond Plant here. The plant is the world's largest producer of cast iron home-heating furnaces. About 700 production workers were laid off. This is the second curtailment this year. Late in May, the plant shut down one of its foundries and laid off several hundred workers. The plant discontinued a night shift and laid off 800 workers early in 1948. The recent

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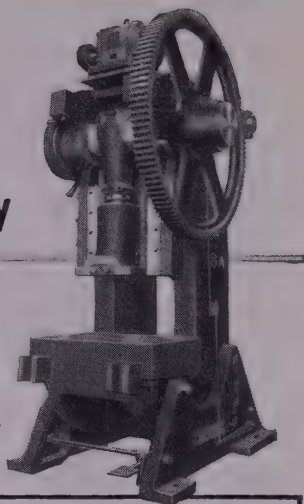


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layoff was attributed to the plant's inventory position and the fact that workers would take vacations.

Philadelphia—Pig iron sellers look for the new month to mark the low point in the present recession, as many foundries and some mills are closing down for vacations. Producers expect to see little improvement in shipments in August, with possibly some further gains in the fall. Pittsburgh Ferromanganese Co., Chester, Pa., which stopped production a few weeks ago, has now sold about three quarters of the 20,000 tons or so of pig iron on hand. In fact, it is said to have cleaned up all of its basic stocks, having recently sold 10,000 tons to one district consumer and 1000 tons to another at what are described as "distress" prices. This producer, it is understood, has also disposed of its ore and coke supplies.

Cincinnati—As expected, the current vacation period which has been almost universally observed, cut further into the volume of pig iron shipments. Accumulation of castings orders, and low inventory conditions may bring some upturn in pig iron demand later this month. However, no signs are visible now of an imminent, marked increase in requirements.

St. Louis—Pig Iron production here continues at 50 per cent of capacity, with the prospect that Koppers Co., the principal supplier, will keep one of its two furnaces banked at least until the end of the foundry vacation period Sept. 1. Iron makers expect the crisis in the pig market to come in September, when orders should show whether foundry inventories have been cut to rock bottom, and also the state of foundries' business. At the moment, most are believed still to have excess iron stocks.

Chicago—Pronounced curtailment in iron making occurred over the Fourth of July holiday week-end, at least five district blast furnaces having been banked. With exception of Inland Steel Co. all integrated producers last week revealed some shut-downs in certain operations would occur. Wisconsin Steel Co. will bank its merchant iron stack from July 1 through 7. Only operation of Republic Steel Corp. which will continue over the Fourth is the coke ovens with resumption planned on July 5. South Works of Carnegie-Illinois Steel Corp. will bank three blast furnaces and shut down open-hearth and bessemer shops from July 1 until July 5. A number of finishing mills will also be closed for the vacation period. At Gary Works steelmaking also will be interrupted on July 4 and 5. At press time a Youngstown Sheet & Tube Co. spokesman was unprepared to say what operations would be curtailed other than a bar mill which will be closed for vacations. Schedules of Interlake Iron Co.'s two blast furnaces were not altered over the holiday.

Birmingham—Even through lacking one furnace (a Republic stack at Birmingham), pig iron output is sufficient to take care of all current demands and results in a moderate stockpiling. Continued improvement in June shipments over those of May indicate a return within the next few months to what merchant iron melters accept as approximately normal.

STEEL

Atlanta Foundry To Close

Atlanta—American Brake Shoe Co. will close the local foundry of its Southern Wheel Division on July 31 because of a lack of orders. The plant, located at Hemphill avenue and Bishop street, manufactures chilled head freight car wheels.

The company plans to sell the plant property and its equipment. Customers of the plant will be served from other company plants throughout the country.

Scrap . . .

Scrap Prices, Page 132

Pittsburgh—Sufficient No. 1 heavy melting steel scrap tonnage has been sold at \$21 to establish a market. Open-hearth dealer scrap is quotable on a nominal basis at \$2 below previous levels on the basis of willingness of dealers and brokers to accept tonnage at this price level. In an active market, the normal differential for No. 1 over No. 2 heavy melting has been \$1 and some brokers and dealers contend this differential will be reinstated when mills re-enter the market for significant tonnages. Demand for short shoveling turnings is practically dormant and July price levels are expected to be off about \$1. In most instances, low phosphorus scrap is being sold at the same price level as No. 1. Trade believes cast scrap grades will be the first to show price strength in event of a steel strike. Based on bids, railroad heavy melting is quoted nominally \$22; railroad specialties within the range of \$24.50 to \$25.

Philadelphia—Scrap buying continues at low ebb, with prices on the major steel and cast grades nominally unchanged. Short shovel turnings, however, are off slightly to \$13.-\$13.50, delivered, bar crop and plate and cut structural to \$21-\$21.50, and bunchings and plate scrap to \$22.-\$22.50. Mass vacations at many consuming plants and general dullness in iron and steel demand will result in a further slackening in shipments this month. Interestingly, however, a cargo of turnings is expected to be shipped to Europe about July 15.

New York—Fairly substantial buying of open-hearth steel scrap for shipment by barge from this district to Lackawanna, N. Y., features an otherwise extremely dull scrap market. Shipment of a modest tonnage of steel mill scrap to Weirton, W. Va., has been concluded and little or nothing is being shipped to eastern Pennsylvania mills. Cast scrap buying is particularly light in view of suspensions at many foundries for vacations. Brokers' buying prices are nominally unchanged.

Buffalo—Dealers continued to shave offering prices in the scrap market during the week. An additional 50 cents was pared from prevailing quotations on steelmaking grades. No. 2 heavy melting was cut to \$17-\$17.50 a ton. Turnings also found the going rough. Machine shop offerings were down to \$10.50-\$11 with buying interest hard to find. An occasional car of No. 1 machinery cast changed hands within the prevailing range of \$22-\$23 with an earlier carload moving at \$24.

Dealers complained about yard stocks piling up. As a result, dealers prices were also slashed. One leading buyer reported taking in No. 1 industrial scrap, unprepared, at \$12 a ton. Dealers reported sellers were balking at the lower prices, but generally were accepting the bids in view of market conditions.

Heavy transshipments here of scrap into Canada continue. About 8000 tons is being unloaded from barges for rail movement into Canada.

Cleveland—New orders for blast furnace grades of scrap were placed last week at \$3.50 below the previous week's price, thus lowering the quotation to \$13.50-\$14, with other grades declining to maintain customary differentials. Buying is ex-

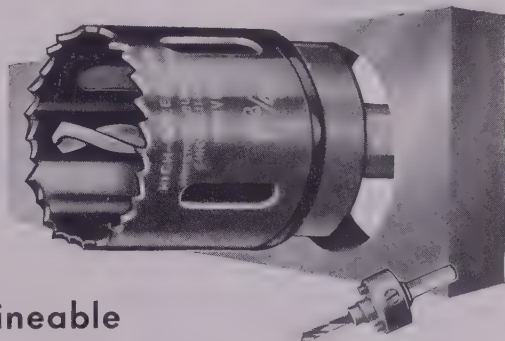
pected to be negligible in July, forcing dealers to stockpile material. However, the low rate of operations at some plants has substantially reduced the flow of industrial scrap. Reduced production and vacations at consuming plants are lowering their scrap consumption.

Detroit—With virtually every steel mill in the country out of the scrap market, recent closing of heavy lists of automotive scrap saw prices tumble an average of \$4 to \$6 per ton from what they brought a month ago. Brokers' buying prices on all steel grades are off \$1 to \$1.50 from a week ago. "Customer relations deals," under which mills paid slightly higher than the market for earmarked scrap, have been discon-

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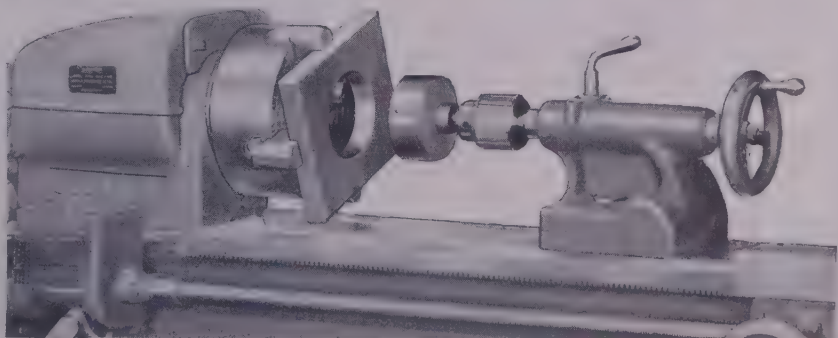


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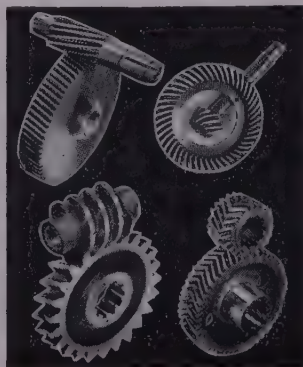
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tinued, and even some normal buying patterns, on bundles for example, have been suspended. Cast iron scrap is somewhat stronger under the influence of buying by Ford and a few independent foundries. No. 1 cupola cast continues to be quoted at \$20-\$21. Unrelenting pressure on automobile production by all producers indicates scrap lists next month will be even higher and, should a steel strike develop in mid-July, there will be a lot of material going begging.

Cincinnati—Prices of scrap are weak as buying continues desultory. A wave of vacation shutdowns has struck this district, pulling down activities still more with the result that scrap demand is at low level. Dealers are unable, in the face of uncertainties, to offer prices high enough to bring out any considerable country scrap tonnage. Although current railroad lists are heavy, some market factors believe curtailments in railroad projects will soon be reflected in smaller offerings of scrap.

Chicago—Recent purchases by two mills confirmed the lower price structure which market appraisal dictated in the previous week. Delivered price of No. 1 heavy melting is \$19-\$20, No. 2 steel \$17-\$18, short shovel turnings \$13-\$14, cast iron borings \$12-\$13, No. 1 railroad scrap \$20-\$21, all being off \$2 from the previous purchases. On the basis of these new orders most other grades in the list moved down sympathetically, rails and cast grades being the exceptions. General feeling is that these orders will make the market for another month. There continue to be substantial piles of scrap at most mills and with the vacation season approaching to take more of the edge off steel demand, opinion is that buying will stay light, and in fact vanish periodically as it has repeatedly done in the last several months. Cast grades, which, in the opinion of some traders, have shown a little strength lately, are believed to be deriving most of their price support from decline in collections rather than improvement in demand.

St. Louis—Three small scrap sales to normally big consumers last week pegged the market quotations for those items a trifle lower. The market in general, however, is unchanged. A quantity of No. 1 cupola cast was sold at \$25, and American Car & Foundry Co. bought some angles at around \$24.50. Granite City Steel Co. made its July purchase of No. 2 steel and bundles at a reported \$18.

An unusually small tonnage was involved since Granite City Steel's cold reduction mill is shut down for three weeks by a motor breakdown, and it is attempting, like other big local consumers, to trim scrap inventories until the steel strike possibility clears up. Laclede Steel Co. does not expect to place its July scrap order until first week of that month.

Brokers report practically no renewal orders and country shipments very slow. Mills and foundries are not getting the third and fourth quarter bookings they had hoped because their consumers know they can get fast delivery on their orders. Some scrap dealers complain their business is suffering also from the reverse of last year's reciprocal deals between factories and steel mills.

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Last year mills were telling factories they would have to return their home scrap in order to get steel. Now the factories are telling the mills they will have to take their scrap or they won't place steel orders. Railroad scrap offerings recently have been heavy, but the same sort of reciprocal pressure has prevented prices reflecting the surplus.

Birmingham—Scrap market conditions are highly unsatisfactory from almost every viewpoint. In the first place, with prices what they are and with heavy melting nominally quoted at \$18, little scrap is coming in.

Los Angeles—With steel making continuing to recede, scrap consumption is declining steadily, and mill buying is almost at a standstill. Accordingly, steel plants are hampered very little by the current strike of workers in scrap dealers' yards. Electric furnace bundles are off \$2 per gross ton to \$26, although heavy melting steel is unchanged.

San Francisco—Movement of domestic scrap remains small, and mill demand shows no signs of increasing. Prices are unchanged, but current quotations are nominal for all practical purposes.

Seattle—Steel scrap is arriving at the mills in tonnage equal to consumption, there being no desire to increase inventories unduly under current conditions. Prices are unchanged on the bases of \$17 for No. 1 and No. 2 heavy melting. Several buying interests are out of the cast iron scrap market which is quoted at \$23 maximum. Supplies are ample for present reduced foundry operations. A cargo of high grade steel scrap has arrived from Manila, including material from industrial sources and from Navy landing craft.

Iron Ore . . .

Iron Ore Prices, Page 128

Cleveland—Shipments of Lake Superior iron ore from the upper lakes increased during the week ended June 27 to 3,019,841 tons compared with 2,812,854 tons for the preceding week and 2,659,468 tons for the like week a year ago, according to the Lake Superior Iron Ore Association, this city.

Shipments from United States ports alone totaled 2,952,901 tons, an average daily loading rate of 421,843 tons, making the total for the season to date 31,362,045 tons, an increase of 2,290,908 tons for the like 1948 period.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 128

Pittsburgh—Continued easing in demand for Connellsville beehive furnace and foundry coke forced prices down another 50 cents per ton last week. The beehive furnace price is now quoted within range of \$13 to \$13.50 per net ton; foundry coke, \$15.50 to \$16. Major steel companies have been out of the market for Connellsville furnace coke for some weeks; in fact, a few interests are reported to be offering larger tonnages of oven foundry coke due to recent reduction in blast furnace operations. However, in most instances oven foundry coking cycles have been lengthened.

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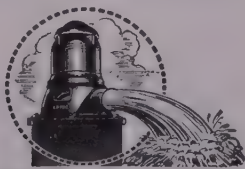
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Warehouse . . .

Warehouse Prices, Page 129

Philadelphia — Jobbing demand is off seasonally, reflecting suspensions at various consuming plants for vacations, and a relatively low ebb in manufacturing requirements. Distributors generally will keep plants open, staggering vacation schedules, rather than suspending entirely for mass vacations. One important exception, however, is a Trenton, N. J., jobber which is closing down for the first two weeks in July.

Pittsburgh — Distributors reduced cold-finished carbon bar prices 25 cents to \$5.40 per 100 pounds last week. This is in line with similar action initiated by warehouse interests in other districts. Warehouse arbitrary size extras on cold-finished carbon squares and flats also were reduced 50 cents. Steel distributors have reduced galvanized sheet prices \$1 per ton to \$6.80 per 100 pounds for 10 gage base. Current price reflects 9-cent zinc. June shipments from warehouse stocks are 40 to 50 per cent below comparable 1948 month and further reduction is indicated for July.

Cincinnati — Warehouse business continues spotty, with some customers temporarily suspending purchases because of vacation shutdowns. However, coal mining interests are again taking steel so that July volume may hold close to that in June.

Chicago — On the average it is estimated that warehouse shipments here are down at least one third from last year, one company reporting its tonnage being about the same as that moved in 1940. Inventory caution is, of course, a major contributor to the lack of new business. Numerous examples can be cited of companies going to great lengths to use steel now in stock as substitutes rather than buying proper sizes. Freight absorption is being widely practiced by warehouses here, only two local distributors reportedly continuing to adhere to a strict f.o.b. basis. With competition strenuous in nearly all products, quick clarification of the pricing muddle is essential, distributors say.

Los Angeles — Increase in inquiries during recent weeks is slowly being reflected in the volume of business done by warehouses. All products are in good supply, with the exception of light gage galvanized, and some diameters of pipe. There is considerable buying and selling of surplus inventories at cut prices among the smaller jobbers. Customers are specifying on a hand-to-mouth basis, and looking for bargains. Galvanized sheet has been reduced 25 cents per 100 pounds, from \$8.05 warehouse to \$7.80.

Canada . . .

Toronto, Ont. — Primary iron and steel shapes produced in Canada for March reached the all-time record total of 354,527 net tons, which compares with 300,916 tons in February and 302,902 in March, 1948.

Shipments of primary iron and steel shapes for sale in March amounted to 262,408 net tons of which 250,279 tons were carbon and 12,234 tons alloy steel shapes.

Of shipments for sale in March,

57,916 tons went directly to railroads and railway car shops; 11,157 tons to pressing, forming and stamping plants; 34,396 tons to merchant trade products; 34,290 tons to building construction; 19,165 tons to the containers industry; 14,391 tons to agricultural equipment; 17,384 tons to the automotive industry; 12,174 tons to machinery plants; 3349 tons to shipbuilding; 6939 tons to mining, lumbering, etc., and 3162 tons to miscellaneous industries. Wholesalers and warehousing accounted for 30,884 tons and exports for 17,306 tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

14,800 tons, Mellon-U. S. Steel office building, Pittsburgh; Turner Construction Co., New York, general contractor. American Bridge Co. received contract for 14,000 tons of structural steel; Carnegie-Illinois, 800 tons of sheet piling; 700 tons reinforcing bars also involved, but not yet placed.

4790 tons, state projects, Bronx River Pkwy., New York, to Harris Structural Steel Co., that city. Work comprises a 4100-ton viaduct and two bridges, involving 690 tons.

2400 tons, steel arch bridge superstructure, Annisquam river, Gloucester, Mass., to Bethlehem Steel Co., approximately \$1,232,000; direct bids, Harris Structural Steel Co., New York, second low.

390 tons, gear test station, General Electric Co., Philadelphia, 300 tons to American Bridge Co., Pittsburgh, and 90 tons to Bethlehem Fabricators Inc., Bethlehem, Pa.

430 tons, superstructure, Penobscot river bridge, Lincoln-Chester, Me., to Lackawanna Steel Construction Corp., Buffalo, N. Y., \$117,823.40; bids June 22, state highway commission, Augusta.

250 tons, St. Francis hospital, Biddeford, Me., to Groisser & Shlager Iron Works, Somerville, Mass.; George A. Fuller Inc., Boston, general contractor.

225 tons, Chinese merchants building, Boston, to Groisser & Shlager Iron Works, Somerville, Mass.; Mathew Cummings Co., Boston, general contractor.

200 tons, Admiral Way bridge, Seattle, to Isaacson Iron Works, Seattle; T. N. Buchanan Co., Seattle, general contract, \$117,063.

200 tons, St. Arden's parochial school, Williston Park, Long Island, to Grand Iron Works Inc., New York.

200 tons, Our Lady of the Rosary of Fatima school, Jackson Heights, New York, to Grand Iron Works Inc., New York.

200 tons, Sacred Heart Parochial school, Cambria Heights, Long Island, to Grand Iron Works Inc., New York.

190 tons, bridge superstructure, 158-foot wide flange beam, Springfield, Vt., to Vermont Structural Steel Co., Burlington; Miller Construction Co., Ludlow, Mass., general contractor.

150 tons, building, Diamond Ice & Coal Co., Wilmington, Del., to Bethlehem Steel Co.

105 tons, walers, Grahamsville, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, state highway bridge, Danvers, Mass., to American Bridge Co., Pittsburgh; Henry Lundgren Co., Worcester, general contractor.

100 tons, state bridge, Lehigh county, Pa., to Bethlehem Steel Co.

STRUCTURAL STEEL PENDING

1225 tons, engine assembly shop, Quonset Point, R. I., naval air base; Turner Construction Co., Boston, low.

500 tons, municipal disposal plant, New York; bids July 14.

500 tons, Montclair, N. J., branch of Hahne store, Newark, N. J.; bids closed.

400 tons, paper mill, New London, Conn.; bids in on general contract.

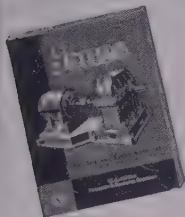
290 tons, Okanagan river bridge, Washington; Willett & Son, Wenatchee, Wash., low \$293,314, to U. S. Engineer.

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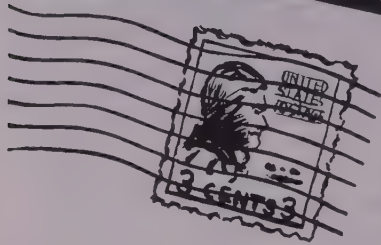
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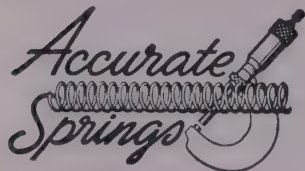
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240 tons, McKenzie river bridge, Oregon; Valley Construction Co., low, \$53,415 to Public Roads Administration.

200 tons, Museum of Science, Boston; bids July 8.

140 tons, tank park, Ft. Meade, Md., Smith deCorse & Christhilf, Baltimore, low on general contract.

Unstated, second Kenai river bridge for Alaska Railroad; M. P. Munter, Seattle, general award at \$182,868.

Unstated, storehouse, service buildings and other improvements for Northern Pacific Railway, Seattle, \$150,000 project; general contract to Noble W. White, Seattle.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2100 tons (640 tons previously reported placed) Northgate suburban shopping center, Seattle, to Bethlehem Pacific Coast Steel Corp., San Francisco; general contract to H. S. Wright Co., Seattle.

300 tons, Haller Lake school building and other construction to Bethlehem Pacific Coast Steel Corp., San Francisco.

175 tons, two bridges, Newburyport turnpike, Danvers, Mass., to Truscon Steel Co., Boston; Central Construction Co., Lawrence, Mass., general contractor.

REINFORCING BARS PENDING

2100 tons, Keller-Block apartment house, Seattle; Harfst-Henson Co., Seattle, general contractors.

Unstated, 5-story addition to Our Lady of Lourdes hospital, Pasco, Wash.; Strand & Sons, Seattle, low \$647,964; J. W. Maloney, Seattle, architect.

Unstated, University of Washington 3200-foot utility tunnel; general contract to Rumsey & Co., Seattle, \$547,668.

Unstated, concrete pipe and outfall project, Portland, Oreg., unit of \$12 million disposal project; Guy A. Atkinson Co., San Francisco, low, \$647,748.

PLATES . . .

PLATES PENDING

250 tons, 2-million-gallon water reservoir, Grand Coulee, Wash.; bids in.

Unstated, oil storage tanks at Olympia, Wash., for The Texas Co., bids soon.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chesapeake & Ohio, 146 diesel-electric locomotives; forty 1000-horsepower, twenty 1500-horsepower road switching units and twenty 1000-horsepower and two 3-unit 3000-horsepower switch engines to the Electro-Motive Division, General Motors Corp., La Grange, Ill., and fifty-eight 1000-horsepower and two 1500-horsepower switching units to the American Locomotive Co., New York.

Richmond, Fredericksburg & Potomac, five 2-unit 4500-horsepower passenger and five 4-unit 6000-horsepower freight diesel-electric locomotives to the Electro-Motive Division, General Motors Corp., La Grange, Ill.

Spokane International, nine 1000-horsepower diesel-electric road switch engines to the American Locomotive Co., New York.

LOCOMOTIVES PENDING

Indiana Harbor Belt Railroad will close bids on diesel locomotives under serial contract No. 17-1949, July 6, through F. S. Austin, vice-president, purchases and stores, Room 344, 466 Lexington Ave., New York.

RAILROAD CARS PLACED

New York, Chicago & St. Louis, 200 fifty-ton box cars to the American Car & Foundry Co., New York.

RAILROAD CARS PENDING

Detroit, 60 trolley coaches, bids rejected.

RAILS PENDING

Board of Transportation, New York, 17,000 tons of standard rail and 2500 tons of special heat-treated rails; bids asked.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

COLUSA, CALIF.—Union Oil Co., 425 First St., San Francisco, will build a \$100,000 storage and truck distribution center.

CORCORAN, CALIF.—Salyer Farms, 900 Whitley St., has awarded a \$500,000 contract to Berlinger Construction Co., Box 716, Chico, Calif.

RICHMOND, CALIF.—The Texas Co., 925 Broadway, Los Angeles, will build a \$3 million marine terminal, including warehouse, office, wharf, etc.

DELAWARE

SEAFORD, DEL.—E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., will spend \$250,000 in a nylon manufacturing plant expansion; H. M. Gordon, c/o owners, Construction Division, engineer.

FLORIDA

PALATKA, FLA.—Hudson Pulp & Paper Corp. will build a \$500,000 warehouse at existing plant near Palatka on St. Johns river; owner builds.

GEORGIA

ATLANTA—Massey-Harris Co., 1721 Packard Ave., Racine, Wis., will build a \$100,000 warehouse and office.

IDAHO

POCATELLO, IDAHO—Butler Mfg. Co., 7400 E. 13th St., Kansas City, Mo., will build a \$100,000 plant.

ILLINOIS

BEDFORD PARK, ILL.—Corn Products Refining Co. will erect a \$3 million boiler plant; Sargent & Lundy, 140 S. Dearborn St., Chicago, engineer.

BLUE ISLAND, ILL.—Gary Steel Supply Co., 2300 S. Springfield St., Chicago, will build a \$270,000 factory; Abell-Howe Co., 53 W. Jackson Blvd., Chicago, consulting engineer.

CHICAGO—Illinois Bell Telephone Co., 212 W. Washington St., has awarded a \$450,000 contract to W. E. O'Neil Construction Co., 2151 N. Clybourne St., for construction of a warehouse; Holabird, Root & Burgee, 180 N. Wabash St., architect.

PLAINFIELD, ILL.—Peoples Gas Light & Coke Co., 122 S. Michigan St., Chicago, will spend \$6 million in construction of a gas storage depot for natural gases; Chicago District Pipe Line Co., 122 S. Michigan Ave., engineer.

INDIANA

GARY, IND.—Carnegie-Illinois Steel Corp. has awarded a \$4 million contract to F. H. McGraw & Co., 58 E. Washington St., Chicago, for construction of an expansion to the Gary tin works; Wean Engineering Co., Youngstown, architect.

GOSHEN, IND.—Goshen Mfg. Co., E. Reynolds St., will build a \$140,000 factory; plans by Hubert Miller, 120½ S. Main St.

HAMMOND, IND.—S. G. Taylor Chain Co., 3-141 St., will build a plant; plans by Bachman & Bertram, 5116 Hohman St.

IOWA

DES MOINES, IOWA—Iowa Plant Food Mfg. Co., 300 Farm Bureau Bldg., has awarded a \$1 million contract to John J. Harte Co., Forsyth Bldg., Atlanta, for construction of a plant.

SANBORN, IOWA—Farmers Co-operative will erect a \$125,000 grain elevator.

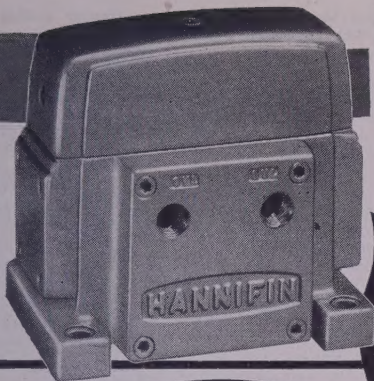
KANSAS

ARKANSAS CITY, KANS.—Atchison, Topeka & Santa Fe Railroad, T. A. Blair, chief engineer, 80 E. Jackson Blvd., Chicago, will build a \$362,000 passenger station.

KENTUCKY

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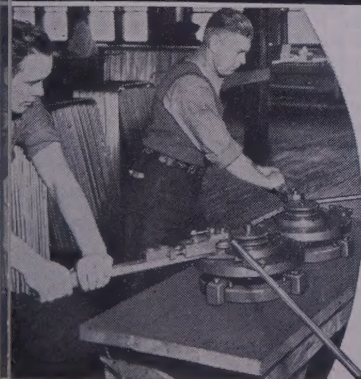
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c/o Joseph H. Kolbrook, Starks Bldg., will build a \$200,000 auto sales and service building.

MARYLAND

HURLOCK, MD.—Louis & Oscar Bogash will spend \$125,000 in rebuilding a factory.

SALISBURY, MD.—I. V. Theis will rebuild a garage and commercial building; approximate cost \$225,000.

MASSACHUSETTS

WOBURN, MASS.—United Motors Service Division, General Motors Corp., 3044 W. Grand Blvd., Detroit, will build a \$150,000 warehouse and office, Cross St.; plans by Argonaut Realty Division, General Motors Corp., 3044 W. Grand Blvd., Detroit.

MICHIGAN

DETROIT — Douglas-Cloud Co. was low, \$383,500, on bids opened by Veterans Administration for alterations to its new regional office, the Krolik Bldg. Work to be performed includes general construction alterations, as well as plumbing, heating, electrical and ventilating work.

MINNESOTA

ST. PAUL—Minnesota Mining & Mfg. Co., 800 Fauquier Ave. will build a \$500,000 factory, Reaney Ave. between Arcade and Mandota Sts.

MISSISSIPPI

CLEVELAND, MISS.—Baxter Laboratories Inc., Morton Grove, Ill., will build a \$500,000 plant.

NEBRASKA

BELLEVUE, NEBR.—Loup River Public Power Dist., Columbus, Neb., will build a \$3 million power plant; P. E. Haupton, c/o owner, engineer.

NEVADA

RENO, NEV.—Pacific Greyhound Lines, Pine & Battery Sts., San Francisco, will spend \$175,000 in construction of a bus depot, plans by E. Keith Lockard, 232 W. First

St.; \$100,000 for a bus loading platform; Keller & Gannon, 126 Post St., San Francisco, consulting engineer.

NEW YORK

BROOKLYN, N. Y.—Industrial Lithographic Co. Inc., 285 Madison Ave., New York, will build a \$400,000 printing plant, 6304-24 Eighth Ave.; plans by Freed & Gordon, 624 Madison Ave.

BROOKLYN, N. Y.—General Linen Supply & Laundry Co., 553 Marcy Ave., will spend \$100,000 for a shop and garage alterations, 104-06 Stockton St., plans by Michael Mario, 200 Beverly Rd.

WOODSIDE, N. Y.—Waddington Milk Co., 102 W. 24th St., New York, will build a \$110,600 garage, milk depot, 58th St. & 56th Drive; plans by W. H. Fuhrer, 505 Fifth Ave., New York.

OHIO

AKRON—Shell Petroleum Corp., 2000 W. 25th St., Cleveland, will build a \$200,000 wholesale and garage building.

ASHTABULA, O.—Hooker-Dextrex Inc., Niagara Falls, N. Y., will build a \$1.5 million factory on a 25-acre site on State Rd.

CLEVELAND—Tinnerman Products Inc., 2038 Fulton Rd., may build a plant; plans by McGeorge-Hargett & Associates, 7016 Euclid Ave.

YOUNGSTOWN—Trimedge Inc. will erect a new plant in Wickliffe, Mahoning Ave., on the site of the former plant, partially burned out in 1948.

OKLAHOMA

ELK CITY, OKLA.—Public Service Co., 600 S. Main St., Tulsa, Okla., will build a \$1 million power plant.

PENNSYLVANIA

WEST POINT, PA.—Sharp & Dohme Inc., Broad & Wallace Sts., Philadelphia, will build a \$4 million medical research laboratory.

TENNESSEE

MEMPHIS, TENN.—Massey-Harris Co., c/o

Hanger & Heyer, architect, Commerce Bldg., has awarded a \$500,000 contract to Building Constructors Inc., Dermon Bldg. for construction of a factory.

TEXAS

FREEPORT, TEX.—Dow Chemical Co. has awarded a \$1 million contract to Teleps Construction Co., 3900 Clay St., Houston for construction of an industrial building.

HOUSTON—Houston Club, c/o J. S. Abercrombie, Commerce Bldg., will build a \$2,250,000 garage, McKinney St.

LONGVIEW, TEX.—Eastman Kodak Co., 2 State St., Rochester, N. Y., will build a million plant.

SAN DIEGO, TEX.—Coast Oil Corp. will build a \$800,000 refinery.

SEELIGSON, TEX.—Humble Oil & Refining Co., 1216 Main St., Houston, will build \$975,000 gas injection plant, own forces.

VERNON, TEX.—W. T. Waggoner Estate c/o R. B. Anderson, manager, will build \$500,000 warehouse and office; plans by W. son & Patterson, Major Bldg., Ft. Worth, Tex.

VIRGINIA

LYNCHBURG, VA.—Appalachian Electric Power Co. plans an \$800,000 expansion program.

WEST VIRGINIA

HASTINGS, W. VA.—Carbide & Carbon Chemical Co., 30 E. 42nd St., New York, will build a \$250,000 chemical plant addition; Ford, Bacon & Davis, 39 Broadway, New York, consulting engineer.

WISCONSIN

MADISON, WIS.—Royster Guano Co., Demsey Rd., will build a \$200,000 storage building and loading platform.

WYOMING

WORLAND, WYO.—Texas Gulf Sulphur Co. United States National Bank Bldg., Galveston, Tex., has awarded a \$3 million contract for a gas treating plant and a sulphur recovery plant to Girdler Corp., 224 E. Broadway, Louisville.

PRICES OF LEADING FERROALLOY PRODUCTS

(Continued from Page 129)

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, \$1.40 per lb of contained Ti; less ton \$1.45, (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot \$1.28, less ton \$1.35. F.o.b. Niagara Falls, N. D., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, \$160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, \$175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, \$2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.). \$3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), \$3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots, \$1.20 per lb of contained V₂O₅, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). Contract, 10,000 lb W. or more, \$2.25 per lb of contained W; 2000 lb W to 10,000 lb W, \$2.35; less than 2000 lb W, \$2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, \$2.90 per lb of contained W; less than 1000 lb W, \$3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferrobore: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, \$1.20 per lb of alloy. Less than 100 lb \$1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-15% B) \$1.20; Grade C (19% min. B) \$1.50.

Borosil: (3 to 4% B, 40 to 45% Si), \$6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot 2" x D, \$2.90 per lb of contained Cb, less ton \$2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.7-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, M 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed 1/4" x 12 M, 16.5c per lb of alloy, ton lot 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 11%). C.l. packed, 17.00c per lb or alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of \$3 for each 1% of above or below the base); Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, Tenn.; \$65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity \$1.10.

Technical Molybde-Oxide: Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa. packed in bags containing 20 lb of molybdenum, 95.00c.



GROMMET
V-BELT

ORDINARY
V-BELT

20 to 50% more V-belt value at no extra price

Exclusive B. F. Goodrich grommet construction cuts belt costs

B. F. GOODRICH grommet V belts are actually a premium belt at *no extra price*, because they deliver more horsepower and outlast ordinary V belts of the same size. Grommet construction (U. S. Patent No. 2,233,294) is the reason these belts give you more for your V-belt dollar.

Higher flexibility, better grip—A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends (as in an ordinary V-belt cord section), no weakened, stiff section where a "splice" occurs. This means better flexibility, better gripping power—up to

$\frac{1}{2}$ more power to you!

Concentrated cord strength—All the cord in a grommet V belt is in the twin grommets, placed close to the pulley driving faces for maximum power delivery. There is no wasteful dispersal of cord strength, no uneven load distribution. That is why—size for size—grommet V belts can take heavier shock loads, with a higher safety factor.

20 to 50% longer life—Grommet V belts, tested on multiple drives, actually lasted 20 to 50% longer than ordinary types of Multi-V belts! For one thing, 85% of the failures that occur in ordinary belts at the "splice" section, can-

not occur in grommet belts where the cord is *endless*. And all the cords work equally in a grommet belt, no cords overwork. Less heat is generated, cord and adhesion failures are fewer.

Twin grommet construction is a B. F. Goodrich "exclusive". Now made in D and E sizes only. To make sure you get genuine grommet V belts, see your local distributor. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY
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Behind the Scenes...

Silly Season

Seems that our limericks have located a few limerick-lovers here and there about the country. From Newark, N. J., where baseball has become a forgotten sport, comes this one:

A man with a morbid obsession
Thought sure we were in a depression.

But he read STEEL one day
Then folks heard him say,
"What the heck, it's only a recession!"

Here's another:

There was a young bard from Japan,
Whose poetry never would scan.

"The reason is this,"

He said with a hiss,

"I always try to put many more
syllables in the last line than
I can!"

But enough of that, at least for today. Since this is the silly season, with people all over going silly from the heat, as well as other causes, perhaps we can get away with this small amount of same.

Only Us Poor Folks Left

If you think things are rough, that we're rapidly going to the dogs, etc., etc., consider this small statistic which was recently issued by official British sources: At the present time there are only 250 persons in the British Isles who have \$20,000 or more annually left after taxes. That's probably listed as one of the major achievements of the Labor Government. However, from what we read elsewhere, it doesn't take into account the refugees with millions who have officially moved to Kenya Colony and elsewhere.

Cribbing Some Slips

Slips in the press are always good for a chuckle from us, having had our share of experience in the commission of same. We read a few new ones in the Postage Stamp, one of our favorite cribbing sheets, and we are letting you readers in on them:

Wanted—a boy to take care of horses who speak German.

Sale—25 men's wool suits—\$15.00—they won't last an hour.

Situation Wanted: Experienced young girl able to do fancy cooing.

A classic news story blunder reported that a Mr. Blank was a "former defective on the police force." Loud squawking by the gendarme caused the editor to retract

as follows: "We regret the typographical mistake in which we refer to Mr. Blank as a former defective on the police force. What we intended to say is that Mr. Blank is a former detective on the police force." And not even the society editor is above reproach, viz., this candid report, "Mrs. Robbins, Woman's Club president, announces that the final meeting on Wednesday will be hell."

Coat or Pants?

From some promotion issued by the clothing industry (male) we note that the big job ahead is to sell a half a suit of clothes annually to each man in these United States. Figures show that he (the average man, that is) buys only half a suit per year. If he would only buy the other half, things would be better all over. And, we might add, his figure probably wouldn't show as much, either.

Twin Streaks of Rust?

Our circulation department was somewhat jolted the other day. They received an answer from a railroad where they had been trying to sell a subscription to the purchasing agent. The reply allowed as how they weren't interested in any subscriptions today, thank you, because their railroad had just been sold, junked, and they were out of business!

Fifty Years Ago

Notes from our issue of July 13, 1899—Mr. Wellman of the Wellman-Seaver Co., Cleveland, has gone to New York to meet the members of the Japanese Embassy and discuss a new steel mill for Japan. Mr. Seaver of the same company has gone to Canada to discuss a new integrated steel mill in Toronto. The company is now building a new mill in England. Two new blast furnaces will be built by the Illinois Steel Co., at 86th street, South Chicago. M. M. Garland, surveyor of the port of Pittsburgh, is organizing a company to be known as the American Safe & Lock Co. And, the round trip fare from Cleveland to Atlantic City via the Pennsy is \$13.50.

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STEEL

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MAIN OFFICE

Penton Building, Cleveland 13, Ohio
Main 8260

BRANCH OFFICES

New York 17 16 East 43rd St.
Murray Hill 2-2581

Chicago 11 520 North Michigan Ave.
Whitehall 4-1234

Pittsburgh 19 2806 Koppers Bldg.
Atlantic 3211

Los Angeles 4 130 N. New Hampshire Ave.
Fairfax 1758

London: 2 Caxton St., Westminster, S.W.1

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